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OBSERVATIONS ON SOUNDNESS.

BY R. H. DYER, M.R.C.V.S., LIMERICK.

(*Continued from page* 156.)

THIS discharge from the nostril is the most insidious, and at the same time most dangerous form of the complaint, and one which requires our best services. I have often failed to detect any alteration of the submaxillary glands in these affections. It is said that Nasal Gleet is communicable by means of inoculation, the glands assuming that particular appearance met with in Glanders. In the case referred to by me I could not say there was any change discernible in the glands of the pony; the only symptom present was the *altered colour* and appearance of the Schneiderian membrane. I have often observed this membrane to assume a striated aspect, which has induced me to look closely for other symptoms; and such was the case in this instance. A qualified practitioner of veterinary medicine, who examined the pony referred to, was actually aware of the experiment and its results upon the ass, yet gave a certificate to the effect that the animal was *sound* and *free from disease*, and especially was he free from Glanders. I cannot understand how any man can do such extraordinary things as these if he has a reputation at stake. I can only account for it in one way—viz., such a person as I have alluded to never *reflects*, never gives himself any trouble concerning the profession he is a member of.

With this experience before us, we cannot exercise too much caution in endeavouring to ascertain every particular and all the symptoms relating to diseases of the membrane of the nose. It has been said the Schneiderian membrane is very thick; that it lines the cavities of the fossæ; that its colour is of a pinkish hue; that it is influenced greatly by atmospheric air, and, it may be added, by the gases found in the stable; also, that it secretes mucus, etc. This all reads well. How often are we told that this membrane assumes a perfectly healthy appearance, when in fact it is not healthy? Often it is anything but of a *pink* colour. We are all aware of the susceptibility of the horse to catarrhal affections, and it is not unreasonable to suppose that not only a change of colour, but of its substance also, might, and does occur after repeated attacks of a cold. If we reflect for a moment upon the vast extent of mucous membrane lining the air-passages, we need not be surprised at horses becoming whistlers, wheezers, pipers, high blowers, bulls, grunters, roarers, etc. The only wonder is that they escape so often. Nasal Gleet sometimes terminates in Glanders. Has any veterinary surgeon, when *first* called to treat a case of Nasal Gleet, inoculated an animal with the nasal discharge for the purpose of testing its innocuousness? I have never heard of its being done. In that case to which reference was made I succeeded in producing Glanders. That was a great fact. Who can assert that many cases of Gleet, in some particular stage, are not capable of propagating this disease? I am inclined to the opinion that a lesser number of cases of Glanders would be met with if we would sacrifice an animal, of little money value, occasionally; at all events human life would be spared more frequently than it is. A case was recorded of a boy some time since having died of this loathsome complaint; how or in what manner the disease was contracted was not satisfactorily proved. That the boy had something to do with a horse suffering from Glanders there was not the shadow of a doubt; at the same time, evidence was wanting to fix the *receiving* of contagious matter *from* the *animal in question*. Still, no person can come to any other conclusion than that of the lad having been poisoned with the matter of Glanders. I am, therefore, of opinion that an animal

at the time it is presented for examination, having a nasal discharge, with an approach to an unhealthy state of the mucous membrane, should be *rejected*.

(*To be continued.*)

CASES IN PRACTICE.

BY W. L. WILLIAMS, V.S., MONTREAL, CANADA.

Impotence in a Stallion.

EARLY this summer I was asked to see a valuable imported Norman stallion, which, the owner said, could not serve mares. The horse was an exceptionally large and well-developed animal, to all appearances perfectly sound.

A large, roomy mare, in "season," being at hand, afforded a good chance for observation. The horse, although quite amative, was not unusually so, but as eager as could be desired, erection of penis prompt and normal.

He repeatedly mounted the mare in good style, and after some excitement, would enter the vagina to a distance of perhaps four to six inches, when he would abruptly withdraw his penis as though from some sudden pain, and after making five or six such attempts, would dismount.

Repeated mounts resulted invariably in the same manner, no semen escaping in any case so far as could be observed. The previous history of the case is not at command, he having been imported less than a year ago, and never having served a mare here, nor tried until last spring, when, after repeated trials, he was returned to the importers, where I examined him. His penis is of medium size, and perfectly natural as far as can be seen. The testicles are well formed, good size, and normal consistence.

An ordinary catheter passed readily into his bladder, and with catheter *in situ* rectal exploration revealed nothing abnormal, except that, in my experience, as a rule, semen can readily be passed from the vesiculæ seminales out through the catheter when partly withdrawn, whilst in his case none could be obtained.

There was no enlargement of the prostate, and both vesiculæ seminales appeared small and empty.

Can some reader of the Journal inform me what I have to deal with, and how to treat it? It could not be an obstruction in the urethra, or the catheter could not be so readily introduced, nor could it well be an obstruction in the outlet of the vesiculæ into the urethra, or they would be distended with semen.

The horse's movements are apparently perfect, so it is scarcely possible to understand how it could depend upon any spinal lesions; and further, he appears to have no difficulty in assuming the necessary position for successful coitus, so long as the penis does not enter the vagina.

Dystokia.

During April last was called to attend a medium-sized, aged mare, in foal to an imported draught stallion. She had been in labour twenty-four hours, and had been manipulated by several neighbours, who were only successful in badly irritating the genital passages, and making the mare so restless and vicious, that upon my attempting to make an exploration she at once began shifting about and kicking, and in spite of twitch and side-lines, could do nothing with her until she was cast and securely tied.

The foal, large and fully developed, lay in the anterior vertebro-sacral position, slightly deviated to the left, the anterior limbs protruding from the vagina, soles downwards. Traction on the feet readily brought the shoulders near enough to admit of imperfect exploration, but the neck could not be reached except for a very short distance, where it disappeared inferiorly beneath the well-dilated os uteri. The head could be plainly felt under the floor of the vagina, the nose against the brim of the pelvis, showing very plainly exteriorly, just above the mammæ. Repulsion could not be effected, neither could the head be dislodged by external nor internal manipulation, and as the mare was not very valuable, was thoroughly exhausted, and rupture of the uterus being suspected, the owner was advised to destroy the mare, but he dissented, and asked that the fœtus should be extracted.

The left fore-leg was pulled away after splitting the skin, two

or three of the exposed ribs removed, making an opening of sufficient size through which all the internal viscera were removed. The ribs were then all cut on each side, when slight traction on the remaining fore-leg brought the fœtus away, with the head and neck deviated to the side.

Upon examination the uterus proved to be intact, and that the head of the fœtus had in some way caught the lower part of the uterus near the os, and pushed it along, infundibulum like, underneath the vagina, where it could be readily felt through the vagina and displaced uterine wall, and constituted a serious obstruction to parturition. The mare lived two or three days afterwards.

During the present summer I was called to attend a high-grade Shorthorn cow, in labour several days. The fœtus was quite putrid, and slight traction on any available part caused it to tear away. Two hind-legs were removed, and more legs were felt, but the decomposition was so great that it could not be determined by exploration what the parts were, nor in what position the fœtus lay.

Previous to my arrival the attendant noticed a tough membrane protruding from the vagina, which he was satisfied could be nothing but the "mater bag," and punctured it with a knife, but when he looked into it found the inside lined with abundant long hair, and the membrane as thick and tough as calf-skin. Examination showed clearly that the peculiar membrane was, indeed, the amnion, and so far as I could reach it was lined thickly with hair.

The cow being in a hopelessly exhausted condition, I advised the owner to destroy her, and hurried off to the train to return—not, however, until I had asked the owner, who was quite an intelligent farmer, to make an autopsy and report the result. The fœtus proved to be a monstrosity with four hind-legs, and the amnion throughout was densely covered with hair as long, if not longer, than that on the fœtus.

I wish at a later period, when I can procure drawings, to describe a very peculiar case of maternal Dystokia in a mare, due to fractured pelvis.

The pelvis, which is in my possession, is quite a curiosity.

"BURSATTI": RECORD OF CASES DURING 1883.

BY RICHARD WM. BURKE, M.R.C.V.S., A.V.D., INDIA.

(Continued from page 163.)

Discrimination must, moreover, be made in the growth of adventitious fungi from the growth of those specific. Dr. Beale* writes: "Whenever animal or vegetable matter is undergoing disintegration and decay, low organisms, it is true, grow and multiply; but *the true cause of the pathological change may have been in operation long before the growth and multiplication of the fungi commenced.*"

Dr. Mitchell says: "Vegetable parasites (the fungi, etc.) are found almost universally on the surfaces, as seen in some of the cutaneous diseases, and may then destroy the structures on which they have fixed."†

Dr. Hardcliffe Crocker,‡ physician to the Skin Department of the hospital, University College, London, says: "Local treatment alone will remove them in a few weeks." Can this be said of Bursatti?

"One of the most common characteristics of fungi is their brief duration—they are doomed to almost immediate destruction."—M. Figuier.

Contagious diseases are characterised by fever; Bursatti is during no stage attended with fever.

There is, *inter alia*, another argument against this *fungus* theory which is still more significant. Surely, if "Bursatti" were due to the action of a vegetable fungus, the disease would be transmitted by contagion most readily. And yet what are the facts? That every native *salootrie* in India handles wounds free from it immediately after he has been touching Bursatti sores, and without any preparation, and this with the most perfect impunity. It may be fair, I think, to state that Veterinary Surgeon Spooner Hart, from his practical connection with horses and their diseases in general in India, which has extended over many years, is entitled to write with some authority; and an analysis of his writings in the *Veterinarian* clearly depre-

* Lionel S. Beale "On the Microscope."
† "Treatise on Cancer." By Dr. R. Mitchell, 1879, p. 5.
‡ "Clinical Lectures on Dermatophytic Diseases," 1881.

cates any notion with regard to the adoption of the parasitic theory of this disease as of doubtful significance, and untenable alike in practice and in theory. His opinions claim serious consideration. He says*: "It has been the custom with Indian veterinary surgeons and the public to treat Bursatti as an infectious and contagious malady, and it is very wonderful how some erroneous inferences and doctrines have originated, and are handed down from time to time, and are accepted. This promulgation of incorrect views does infinite harm, for it has the effect of veiling ignorance, and acts as a barrier to research. Practice, to a great extent, is guided by theory, and therefore it is necessary that true theories should be promulgated. In a practical point of view it is most important to know whether a disease is or is not infectious and contagious, hence I was determined to find out the truth of the statement. Practice and time have afforded ample proof of the non-infectiousness of Bursatti, for my bursatied subjects stand among other animals, and I have never seen any ill effects ensue. I have several times been requested by owners to remove Bursatti cases from the adjoining stall or box; and, really, the contagion theory has existed so long that one experiences great difficulty in satisfying or correcting a believer in the theory. To assure myself on the contagious or non-contagious nature of Bursatti, I took,—

"1. Exudative matter from the surface of Bursatti ulcer, and inserted it under the skin of the same subject from which it was taken. The part became scabbed, and was healed in a few days.

"2. Bursatti matter from one subject, and implanted it under the skin of another bursatied subject, and found that nothing resulted from it.

"3. Exudative matter from an old bursatied subject, and inserted it under the skin of a horse not the subject of Bursatti. This experiment, like the two preceding, threw no light on the matter.

"4. I also had recourse to administering internally Bursatti exudative matter to other subjects, and have likewise

* *Veterinarian*, 1873, p. 386.

drenched them with the blood of bursatied subjects, but without effect.

"*Having repeated these experiments several times, and in each instance with negative results, I infer that the disease cannot be communicated from one subject to another by inoculation, and, therefore, is non-contagious.*"

Mr. John Burke, assistant-professor, Government Veterinary School, Lahore, informs me that—"The 'contagion theory' of Bursatti was exploded some thirty years since by experimental inoculation, and, with the exception of Colonel Apperly, officer late in charge of Poosah stud, I do not believe there are any veterinary surgeons who would now regard the disease as contagious or infectious." And my own inoculation experiments would confirm the above; for both the experiments conducted by other veterinarians before me, and those subsequently done by myself also, during last year, in the way of direct inoculation, have alike failed to establish any connection between this and truly specific affections. Briefly, the disease is not transmissible.

Before the system of morbid pathology—the study of the physical bases of disease—was developed, we veterinarians, as well as the medical faculty generally, were accustomed to test disease by its visible symptoms. Since its development, however, we are come to regard its pathological effects in the determination of the nature of disease rather than as we have heretofore done. Studying the pathological effects of this disease *post-mortem*, therefore, we have proved as conclusively as possible that it is analogous to human Cancer; that is, it produces certain changes in the internal organs of the horse that are inseparable from certain changes in similar conditions with human beings (*vide* VETERINARY JOURNAL *et Veterinarian*, 1882). So far as a knowledge of its pathological anatomy goes, I think I may fairly claim to have been almost the first to have attempted to describe it. One of our latest writers on the subject says*: "Visceral lesions have not been observed by me."

Clinically, it is now my duty to try to illustrate by actual

* "Papers on Bursatti." By F. Smith. VETERINARY JOURNAL, vol. ix., p. 304; 1879.

records what I have before merely preached through odd contributions to the two English periodicals.

I believe that any adequate appreciation of the nature of disease can only come about as a consequence of collective consideration. The prophets of a one-sided study of disease appear to have forgotten entirely the dicta of our predecessors, that all such study and investigations lead to discoveries only to be described concisely in the Latin tongue as *montes et maria!* Unless a more comprehensive and all-embracing view is taken, there is every probability that the true pathology of this disease will be engulfed, and then will certainly devolve on us a re-construction, which will strain the relations of all existing records, and which will be little short of a confusion. The contributions on the subject of the past twenty years have been both important and intelligible; and what is remaining to be done is simple extension of that knowledge by added contributions from different members upon the varied points now touched.

Histology.—The conclusions from the microscopic investigations of Professor Kettlewell, of the Lahore Veterinary School, formerly of the Stud Department, as well as our own, and the concurrence since given by others who have had opportunities of examining specimens prepared by ourselves, we have heard forcibly disputed in these columns by one or two contributors, who have maintained that we cannot make valid our point, and that our "theory" will not stand the test of competent scrutiny. But I must dissent from the authority of our opponents so far as to say that this challenge has been now reversed, as specimens for examination prepared by them, on being delegated to undoubted authority, refused to show any trace of the mistaken parasites. To judge alone by the multitude of guesses that have been from the first hazarded respecting the parasitic theory of the disease, this phase of its pathology would appear to be now well threshed out. Be it remembered that one of its first supporters, Mr. F. F. Collins, late Principal Veterinary Surgeon in India, gave it as his opinion that the disease was "probably parasitic," without ever having placed a section under the microscope; so he believed that the disease was spread "through the use of water," and if it were only regimental horses that suffered from

it, this view might carry conviction with it. But there are hundreds of country-bred horses that are never washed on the head and limbs, there were some studs where for certain reasons this practice was prohibited, and yet Bursatti was as prevalent among these as elsewhere.

To our readers we commit the facts of the case as we know them, for their reflection and judgment, proceeding to details of our own observation bearing on this section of our study—*the histology of Bursatti.* Collectively, we venture to think, they were the first stone left unturned in the search that led to the detection of a chain of circumstances better known commonly, perhaps, under the name of "symptoms." From their consideration was inspired a reliable knowledge of and acquaintance with the radix of the disease. Nor manifestly can pathology ever take rank among the exact sciences until the nature of the disease it treats of has been unmistakably ascertained. I have everywhere endeavoured to supply the ground or wherefore of what I advanced, rather than leave anything to conjecture, whenever a rational cause could be adduced. I grounded and reconciled all my conclusions on a combination of physical, chemical, physiological, pathological and clinical proofs, proofs which exert the strongest influence in shielding from oblivion the close relationship that subsists between human Cancer and equine "Bursatti" in every phase and particular, and which have been fully borne out in responses to questions put by correspondents to the VETERINARY JOURNAL, a correspondence that has helped to clear up, in our opinion, certain points of our contention otherwise left unexplained. I have also since become aware, verbally, that some twelve years or more before my own announcement, Mr. Kettlewell had unhesitatingly decided, and pronounced the *histologic character* of Bursatti to be similar to that of Cancer. Thus it must be admitted that to I. V. S. Kettlewell, equally with ourselves, does the merit of the opinion apply and belong.

Having so far dwelt on the introductory part of this subject in relation to its history, I will notice very briefly the subject of histology proper in connection with Bursatti, and endeavour to discriminate the unquestionable cancerous changes that present themselves.

In every pathological investigation we must, as microscopists, carefully note the histologic characteristics that harmonise with *health;* as any departure from this will obviously constitute a pathological product, which is thus identical with *disease;* insomuch that, when examining any tissue the constitution of which we are already cognisant of, the presence of any flaws in the ordinary arrangement of the constituents becomes a matter for suspicion on the part of the practised pathologist, since it must now be availed of as an invariable sign of inherent disease.

It appertains to the pathologist to determine the nature of that disease change, and hence it is that a pathologist, to be successful, must be a histologist.

We proceed with a retrospect of our observations (*supra*) on the histology of this disease, and for this purpose divide our work into the consideration of its

(*a*) Macroscopic, and
(*b*) Microscopic appearances.

(*a*) A thin section on a slide, and placed before the light shows (*vide* VETERINARY JOURNAL, July, 1881, pp. 20, 21, 22, 23)—V.S. Smith, of the 12th Royal Lancers, believes, that some of the fibres here described are of the nature of "hyphal tubes," and speaks of them as showing bright extremities, rendered yet brighter by the addition of glycerine, of Liq. potassa, etc., and describes them as manifestly hollow bodies. We regret being unable to agree with the views of one who has bestowed so much study on this subject; but our own scrutiny leads us to think that the rods above described are neither more nor less than coarse (yellow elastic) fibres. Although commonly solid, these latter frequently present crevices, fissures, and cavities.*

Cells.—(*Vide* VETERINARY JOURNAL, July, 1881, pp. 23, 24.) In his description of the cells peculiar to Bursatti structure Mr. Smith gives what to us seems undue prominence to a matter which would appear of little practical value, although we are not disposed to reject it without giving it its legitimate consideration. He throughout emphasises the "pigmentation" of the cells common to many specimens, as attaching to it some special

* Prof. W. Rutherford's "Physiology." Part I. 1881.

consequence from the standpoint of its pathological character whereas, those conversant with the views of modern pathologists will see that this goes to explain but very little of the *etiology* of the disease under consideration. I may here mention that in support of my statements I can point to the authority of Sir James Paget, who notices, in his "Literature of Cancer,"* that the "pigmentation" of the cells observable in cancerous disease is entirely an accidental phenomenon, having nothing in common with the pathology of the disease; *i.e.*, it fails to point to any specific bearing on the nature and causation of the disease. And for these reasons we are warranted in judging with Sir James, that the omission of any special mention of pigmentation as an accompaniment of the cells would create no appalling void in the pathology of this disease.

Moreover, we would urge that pigmentation, instead of offering a clue to the causation of the disease, on the contrary, gives evidence only of its *results;* it is therefore not pathogenic. Nor is it through *results* that the pathologist arrives at his conclusions. He hopes to elucidate the nature of disease rather by their ultimate *causation.* And this view, we confidently think, will receive a ready echo from all observers. On this head it would appear expedient to amplify further (*vide* VETERINARY JOURNAL, July, 1881, p. 24, last line; then pp. 88, 89, VETERINARY JOURNAL, August, 1881).

Before quitting the subject of the cells common to Bursatti growths, I would lay the greatest stress on one characteristic especially distinguishing them—their peculiarity of settling or ranging themselves, in the process of the rapid growth of the sores, into peculiar concentric layers, being piled up, as it were, one upon another, in rotation, forming well-defined round or slightly oblong bodies, which in maturity become visible to the naked eye, and can be manipulated by the fingers, and in this way dislodged from their situations. To these bodies the name *kunkur* has been given. *On their exact pathology a good deal of controversy has lately been expended.* Inasmuch as I have already amply explained the nature, formation, and pathological significance of these in another chapter, I may omit it in this page,

* "Surgical and Pathological Lectures," by Sir James Paget.

except just to remark that ***their inception is dependent entirely on the characteristic arrangement of the cells peculiar, not only to Bursatti growths in the horse, but to Cancer structure generally,*** instances of which have been pointed out by Billroth, Abernethy, Wilks, and Moxon, and other authorities; and that inception is expedited by a process of *calcareous* deposition that obtains in all morbid products during their later stages in the equine patient even in excess of that incident to the human subject.

The importance of combining medical with veterinary aid, and *vice-versâ*, can hardly be over-rated, as circumstances present themselves in both where the one is powerless without the appliances of the other. And so it is only by both professions mutually consulting their theories and facts of experience that we may hope to compromise the risks attendant on an exclusive, one-sided engagement with disease, whether as affecting the organism of man or the lower animals. The recent light and disclosures on the nature and pathology of hitherto ill-understood disorders among the animal creation—disclosures effected as results of such co-operation—establish this fact beyond cavil or dispute. Most certain it is that the more this co-operation is developed the more we may hope to find evidence of how many diseases belonging to the lower animals are directly or indirectly related and incident to the higher, viz., man.

Having offered the foregoing observations, I propose very briefly to consider that section of our chapter which may be said to be the most practical in the histology proper of this department of Bursatti. After quoting the views of one or two medical authorities on the difficulties to be overcome in the determination of Cancer structure, a difficulty apparently overlooked by some writers, I shall endeavour to point out the principal obstacles in the task of discriminating that unique presentment of structures peculiar to the formation and growth of Bursatti. In a lengthened discussion at the French Academy of Medicine (*Monthly Journal of Medicine*, January, p. 64; February, p. 166; and March, 259, 1853) respecting the diagnosis of Cancer by means of the microscope, though almost all the speakers—Malgagne, Amussat, Cloquet, Delafond, Bonillan,

Rostan, Robert, and others—agreed that the Cancer structure contained cells, yet they were not agreed as to the cells being characteristic of the disease. Velpeau says*: "For thirty years I have constantly applied the great law of Bichat (cited by M. Robert) to everything in pathological anatomy. But in pathology, anatomy, though very necessary, is not all-important." . . . "The recurrence of Cancer tumours containing no cancer cells has convinced me that the cell is not the pathognomonic sign of Cancer" (p. 170, February No.). It will further be seen that the opinions of Beale, Bastian, Simon, and some of our best histologists in England, also lean in the same direction.

(*To be continued.*)

THE INFLUENCE OF HEREDITY AND CONTAGION ON THE PROPAGATION OF TUBERCULOSIS.

(*Continued from page* 171.)

According to this learned professor, it is sufficient if one of these characteristics is present to justify the rejection of such flesh for human food.†

The principles enunciated by Gerlach have been very differently estimated by competent authorities. *Some pretend that the flesh of tuberculous animals is not fit for food in every case; they adopt more or less the opinion of Gerlach, and demand that an investigation should be made as to whether the flesh is injurious, whatever the development of the disease may be, or if it is only so when it has reached a certain stage, and what that stage really is. Others completely adopt the views of Gerlach;* and others, again, *maintain that the temperature of boiling water destroys the morbigenous principle of Tuberculosis, so that the flesh of animals affected with this disease may be consumed with safety, provided it has been previously boiled* (Lothar Meyer, Decroix); *and they accept the views previously enunciated by Payen, Renault, etc.,* while others are of opinion *that indecision in such a question is inadmissible, and that a conclusion should be arrived at as to whether or not the flesh of such animals should be eaten* (Semmer). *Certain*

* *Monthly Journal of Medicine*, January, p. 64, 1855.
† "Die Feischkost des Menschen."

authorities, as Zundel and Johne, assert that, with regard to the utilization of this flesh, the opinion prevailing in South Germany, for instance (see p. 170), *should be maintained; and some others consider the question as not yet solved, and ask for further investigations.*

The Imperial German Veterinary Council seems to entertain the latter opinion, for at a meeting held in Berlin in 1875, the following conclusions were voted :—

"1. The facts and observations collected up to date, with regard to bovine Tubercular Phthisis and caseous Pneumonia, and more particularly with respect to their transmissibility to mankind, merit attention, but they are not conclusive, and especially do not suffice to convince us as to the danger of Tuberculosis being transmitted to the human species through the medium of the flesh and milk of animals affected with this disease, and to justify prohibition of the sale of these products;

"2. The permanent bureau is authorised to apply to the Chancellory of the Empire for the means necessary to solve the question if, and to what point, the consumption of the flesh and milk of tuberculous cattle is injurious to human health."

The direction of the Berlin Veterinary School, consulted in 1878, in a legal dispute on this subject, in its arbitrative capacity, gives an even more reserved opinion than the German Veterinary Council. The following are the terms in which it gives its views: —"It is not yet proved that the flesh of a cow affected with generalised Tuberculosis, but otherwise very fat and well nourished, may not be utilised as food for man; the scientific experimental researches undertaken with this object have not yet demonstrated that the opinion expressed by different experimentalists, that the flesh of a tuberculous cow, especially when the organism is largely involved, contains an injurious specific principle and ought to be excluded from human consumption, is erroneous," etc.

Johne,* who of all others has best treated the question from a practical point of view, thinks that Gerlach went too far in considering the flesh as hurtful when the disease had invaded the lymphatic glands in proximity to the tuberculous centre.

* "Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie." 1883. Heft 1, 2.

According to Johne, to produce a really injurious effect, *generalised Tuberculosis* must be present—that is to say, the nosogenous principle of tubercle is no longer confined to the peripheral lymphatic circulation, where it was more or less localised, but has reached the thoracic duct and the vascular system, and is diffused all over the body. Whatever may be the species of animal intended for food, if it is affected with Tuberculosis, *and yet the carcase does not present the characters of tuberculous metastasis*—that is, generalised Tuberculosis—infection of the flesh cannot be admitted, and there is no necessity for condemning it, so long as the tuberculous organs, as well as the vessels and lymphatic glands along the course of the circulation from the affected organs to the thoracic duct, are not allowed to be consumed as food. In order to be more certain of safety, the neighbouring vessels and connective tissue surrounding them should also be removed.

With regard to the flesh, Johne remarks that no matter what the condition of the animal may have been, it should be considered as free from danger; at most it is of inferior quality, and should not be rejected if there is no other cause.

It is not the same if the presence of the above alterations renders it probable that the blood is infected. In such a case the entire carcase, no matter how high the condition of the animal may have been, should be seized, as it is unfit for food.

Gerlach and Johne are agreed in maintaining that emaciation is not a necessary manifestation of general infection, as animals affected with pulmonary, hepatic, or intestinal Tuberculosis sometimes waste rapidly without the disease becoming generalised; but cattle suffering from well-marked pleural or peritoneal Tuberculosis may preserve their condition for years, and even fatten—though this fact does not prove that they may not at any moment succumb to general infection.

Zundel is of opinion that, so far as injury or danger from the use of such flesh is concerned, up to the present time only theoretical considerations, based on imperfect experiments which are opposed to the facts derived from close observation, have been invoked. Such opinions cannot retard those measures which are devised with a view to protect the public health; if they

were accepted, a tenth part of the meat actually consumed without inconvenience would be withdrawn from consumption. The discovery of Koch, he adds, shows that the parasite of Tuberculosis is only met with in the pathological productions characteristic of this malady, and are not diffused, like certain other of the infectious diseases, throughout the whole of the juices of the body, nor yet in the blood ; and it is for these reasons that the *Bacilli* are not found in the flesh. As a result, says this learned Principal Veterinary Surgeon of Alsace Lorraine, it follows that the practice hitherto pursued should be in no way modified, and that, as in the past, only the flesh of wasted and wholly infected animals should be interdicted as food ; the utilisation of that which is derived from cattle less diseased may be allowed, if it be recommended to consume it only after it has been well cooked.

If, as is shown by what has been adduced, very diverse opinions have been given on this subject, yet no one has ventured to assert that nothing should be done to prevent the evil consequences likely to attend the use of the flesh of tuberculous animals ; on the contrary, the universal opinion is *that sanitary police measures should be adopted to avert the injurious influence of such flesh.*

The desire of those who, for some years, have considered this question as not capable of solution, and who, for this reason, have urged the necessity there is for new experiments, has been gratified.

These experiments have been made and repeated, and when they have been conducted with proper precautions they have yielded positive results. The *Bacillus* of Tuberculosis has been recognised, isolated, cultivated, and transmitted by inoculation ; whatever may have been the soil from which it has been transferred (man, animals, gelatine, etc.), it has always caused the development of true Tuberculosis in the animal into which it was transplanted, and it could always be transmitted from one inoculated animal to another. The experimental evidence is therefore complete, and the problem may be looked upon as solved. The response is affirmative with regard to the noxious influence of the flesh of tuberculous cattle, and the majority of those who were previously doubtful are now convinced.

If we exclude the opinion of those who believe that the question is not yet sufficiently elucidated, the number of whom should now be very limited, we are finally brought face to face with two very different opinions as to the preventive measures which should be adopted:—

a. According to some, *all the preventive measures may be reduced to the simple advice to cook the flesh well before eating it;*

b. According to others, *the flesh of tuberculous animals should be confiscated, either in every case, or in certain circumstances.*

If the two solutions are examined with regard to their efficacy and their practical application, we are brought to the admission that the first is certainly that which will find the greatest number of adherents among the farmers and butchers, who will support it heartily. "They who eat the flesh or drink the milk," say they, "have only to take care that these are properly cooked; in this condition they are not hurtful, as the temperature of boiling water kills the tubercle parasite, and thus removes all danger of infection."

Cooking is, it must be confessed, a precious means of disinfection—a means which it would be difficult to replace with advantage, when it is desired to ensure the healthfulness of food. While in the North of Germany, where much flesh is consumed in a raw state, it is not possible, even with the aid of the microscope, to prevent outbreaks of Trichinosis; in those countries where meat is nearly always well boiled or roasted that disease is either very rare or unknown, although it may be that nothing more is attempted as a preventive than a facultative inspection and the advice not to eat raw flesh.

The recommendation to consume only cooked flesh and boiled milk is certainly commendable, in order to prevent Tuberculosis in those countries where the recommendation does not clash with deep-rooted manners and customs. Where people are in the habit of consuming raw or imperfectly cooked meat, such a recommendation would not be followed; and as a proof of this we may note that the extensive outbreaks of Trichinosis in North and Central Germany, have not yet caused the neighbours of the unfortunates who succumbed to the malady to abandon the use of raw pork.

When the recommendation to properly cook meat is not favourably accepted by all ranks in society, it cannot be considered a practicable measure for a State which does not wish to resign itself to the *laisser faire* and the *laisser aller* principle, with all its consequences.

That which has just been said with regard to the recommendation, applies with equal force to the prohibition. An inconvenience which is added to the latter, besides non-observance, is that the profane, confiding in the application of the recommendation or prohibition, may believe that *all* cooked flesh is innocuous, which is not exactly correct.

The temperature of boiling water kills the *Bacillus* of tubercle, but this temperature is not attained throughout the whole mass of a piece of meat prepared for consumption ; the portions insufficiently heated may therefore preserve their infective property ; and on the other hand, the germs and spores of the *Bacillus* may resist this temperature and retain their germinative power. (See the experiments of Gerlach and Toussaint.)

If, as a general rule, flesh-food is not perfectly cooked, is not even exposed to the temperature which alters the colouring matter of the blood, ordinary cooking can neither be recommended nor ordered as an efficient preventive, so far as flesh is concerned.

Besides, the question may be looked at from the other side. When we have to consider, in such a case, the preventive measures necessary, it is not alone the interests of the butchers and breeders, that is, the providers of flesh, which should be taken into account ; the consumer should also have a voice in the matter, and his manner of looking at it should even have a preponderating value. He who pays in money for the entire value of the meat he purchases, has a right to expect a corresponding quality in what he buys. In those countries where he is protected by the law, which prohibits the sale of putrid flesh, or that from diseased beasts, the consumer would protest energetically if he were required to purchase that of phthisical or marasmic animals as good and genuine food. Even those who maintain that in no case should we confiscate the flesh of tuberculous animals, and that it is sufficient to boil such flesh,

would not have it offered for sale to the generality of the public (Payen, Renault, Decroix, Lothar Meyer). It is for this reason that Lothar Meyer wished that such flesh should be sold in those places where poor people are supplied with food, as the common cook-shops (*Volks-Küchen*), etc. It is true that this proposition should not be looked upon in the light that the poor are better able to digest such food than the rich, but rather that it is only brought forward on the ground that in hospitals and cook-shops the cooking of animal food is better attended to, and that in accepting such a proposition we are preserving for the poorer section of the population innocuous food, which, under ordinary conditions, would usually be lost.

Although Meyer's proposition might, from a philanthropic point of view, be perfectly justified, it would nevertheless appear, if carried into practice, as if it were intended to make poor people eat flesh, perhaps diseased, which was not good enough for the wealthier classes. The moral effect of such a measure might have more serious consequences than the material and pecuniary losses entailed by the confiscation of animals affected with Tuberculosis.

These are all the remarks we have to offer on the recommendation or obligation to *boil* or *roast* the flesh from tuberculous cattle—a measure which, it must be admitted, is useful and acceptable, but in no way sufficient; and it is these considerations which compel us to notice the other measures which have been proposed.

The second essential proposition which has been put forward, is relative to the *confiscation of the flesh of tuberculous cattle in every instance, or at any rate in certain determinate cases.*

Confiscation in every case would certainly be the most efficacious measure for the preservation of human health. From the veterinary surgeon's point of view, it is unobjectionable, as the diagnosis of the malady is usually very easy, and in difficult and doubtful cases a microscopical analysis would suffice in order to arrive at a decision.

But on the other hand, putting the necessary measures into practice offers numerous difficulties. The old proverb that "The judges of Nuremberg do not hang a man until they have

laid hands upon him" is perfectly applicable here, as it is first requisite to know where the tuberculous flesh is to be found before it can be confiscated. The discovery of such flesh must form part of a most difficult task, as to attempt it an invasion of the domain of the butcher and breeder must be made, and this would provoke a conflict all the more serious as the measure would prove effective; and this is not a hypothesis, but a statement founded on everyday experience.

Partial confiscation, that is, the confiscation of certain kinds of flesh, is, as has been already said, carried out in certain countries, where it is even enforced as a legal measure. Simple prohibition, even when supported by the threatened infliction of a penalty in case of infraction, will not cause butchers and farmers to make a report which may lead to the confiscation of their diseased animal. The dread of the butcher lest the reputation of his establishment should be tarnished through the intervention of the police, induces him to conceal the malady, and all the more readily, as declaring its presence would cause him notable material loss. For these reasons, animals intended for slaughter, abattoirs, and the sale of flesh, have all been placed under the control and surveillance of the police (except in England), for it is only the constant imminence of such control with regard to meat exposed for sale, that gives efficacious support to the announced penalty; and it is the same imminence of control which causes the butcher to conform to the law when he knows he cannot elude it.

The obligation to have all animals intended for food slaughtered in abattoirs and under the surveillance of competent persons; the prohibition of transporting meat, and fresh preparations of meat, instead of killing the animals in other districts; the severe surveillance under which this transport may ultimately be allowed to take place, and an incessant inspection of the butchers' shops—all these are measures of real efficiency against the sale of the flesh of tuberculous cattle.

Notwithstanding all the prohibitions, animals affected with this disease are nevertheless clandestinely slaughtered; as the farmers, the dishonest cattle-dealers, and the low-class butchers are always ready to make the most out of a diseased beast.

In the Grand Duchy of Baden, where a system of meat inspection has been for a long time organised, it is generally admitted by those who are competent to form an opinion, that about 20 per cent. of tuberculous cattle escape inspection.

The sanitary police measures in force (on the Continent) would act in a less satisfactory manner in preventing the sale of such flesh, if they were not to a certain extent seconded in their action by the fact that, from an early period up to the present day, this disease has been classed among those which caused any animal to be warrantable and returnable. The butcher who has, unknowingly, purchased a phthisical beast, incurs a loss which the seller must make good. If the latter does not consent to do so, then the butcher may institute an action against him, and thus make known the malady from which the animal is suffering.

There are, however, cases in which the rights of warranty are lost *a priori*, and in which, consequently, public proclamation of the disease does not take place. Many farmers, and particularly those who know the condition of their animals, or who have already been laid in damages in consequence of the existence of Tuberculosis among their cattle, sell *without warranty*, and usually to greater advantage than those cattle-owners who have confidence in the healthy condition of their animals. The butcher who buys without a warranty has no interest in declaring the existence of the malady which he may detect in the animals he has killed, or is about to kill; he takes good care to kill and dress in a public abattoir the cattle he suspects are affected, and dresses the carcase, removing the diseased parts, and sending the remainder into the market for food. This is one of the least dangerous courses which may be followed in such cases.

Much more serious consequences may result if this flesh is sold to be manufactured into sausages. The manufacturers of these desire a good profit on the meat they buy, and they find this most readily with the owners of cattle who sell without giving a warranty; it is more especially these persons who use up for food the carcases of phthisical cattle which have been in an advanced stage of the affection. In preparing these sausages, all kinds of meat, healthy or diseased, are chopped up together,

and a mass is obtained which is at least disgusting to the eye, and which, being often consumed in a raw, or half-raw state, may compromise the health, and even the life of those who eat it.

The laws of warranty* come therefore to the aid of the sanitary police measures, so far as tuberculous cattle are concerned; but they are as insufficient, as the best-organised system of meat inspection can be, to prevent the noxious action of their flesh in the most serious cases of this disease.

And to-day, as it was during the past century, when all the flesh of a tuberculous cow was given to the knacker, those persons whose interests suffer through these sanitary measures attack the laws or regulations concerning meat inspection, and it would appear that they will not renounce their procedure until these are absolutely abandoned, as has happened before.

The following instance may be cited as evidence of what is now stated. When, inspired by the writings of Gerlach, certain meat inspectors in the Grand Duchy of Baden, among whom may be mentioned Veterinary Surgeon Fuchs, of Mannheim, attempted to apply a little more rigorously and conscientiously the measures prescribed in the regulations for the inspection of tuberculous cattle, the butchers and owners of stock acted in such a manner that serious consequences were apprehended. The latter declared that they would no longer sell to the butchers of Mannheim, or at least that they would not be bound by warranty; and the butchers, on their side, pretended that before submitting to all the risks attending the soundness of meat, they must insist on raising the price. Other butchers announced that they would no longer slaughter in the town abattoirs, but would bring into the town all the meat their customers required. In proceeding thus, the butchers, like cattle-owners and cattle-dealers, threw all the extra charges on the consumer, who, without taking into account the fact that he was all the better protected in his health by receiving better meat, saw only in the application of these severer sanitary measures an attack on his pocket. And the butchers, on the other hand,

* We have nothing like the *lois sur la redhibition* of the French, the *Gewährsmangel* or *Gehwärsleistung* of the Germans.—G. F.

endeavoured to escape from the more severe control, thus further diminishing the guarantee due to the consumer. Such a state of things could not go on, and the more severe measures to which recourse was had for the moment, had to give place to the less rigorous ones previously in force.

If, in order to prevent clandestine slaughter, resort be had to domiciliary visits, rewards for information, etc., considerable police expenses will be incurred, and this without any certainty of achieving the desired result. The persons who keep hotels and boarding-houses of an inferior class, would still remain the customers of those who slaughtered phthisical cattle without informing the authorities. The more the unenlightened public continue to ignore the danger they incur in consuming such flesh, or to doubt the reality of this danger, the more they will consider the application of these preventive measures as a new and useless vexation emanating from the police, and be inclined to resent the more active intervention of the authorities.

If the confiscation of tuberculous cattle has already met with great difficulties when carried into practice, these difficulties are much increased when attempts are made to determine in what cases flesh may be admitted for consumption, and in what cases it should be prohibited; and *technical difficulties* must also be added to the list.

When it is decided to seize *all* the flesh of phthisical cattle, it suffices to establish the existence of the lesions of Tuberculosis, in order to decide if the flesh of a tuberculous beast *may* or *may not* be allowed for food. In the latter case, it is necessary not only to endeavour to determine minutely the extent and degree of development of the tubercular alterations, but we ought also to know how and where to select the infected portions of the carcase from those which are to be utilised as aliment.

The knowledge necessary to meet all these requirements is only to be found combined in the veterinary surgeon who practises these inspections.

Some authors, who, like Gerlach, are of opinion that there may be admitted as food certain portions of the flesh of tuberculous cattle and other portions refused, recognise the difficulties to be encountered when one is required in such a matter to

decide in a given case; then the most experienced and skilled practitioner will often find himself embarrassed.

In treating of these difficulties, Gerlach, among others, says:—"When we have to deal with things, and have arrived at that point that we must differentiate between them, we may always arrive at opposite conclusions. If it is already very difficult to trace a limit between health and disease, it is still more difficult to establish exactly the moment when the virulent principle of a morbid process, primarily localised, becomes generalised in the organism. If on such a limit or frontier conflicting interests meet, we need not be astonished that divergent opinions may arise. The meat-inspector will perhaps demand in a given case the absolute rejection of the flesh of a diseased animal, and the breeder or dealer—in a word, the owner of the animal—will claim that the flesh may be perfectly fit for consumption; the latter will only yield to confiscation when there is nothing to reject—that is, when the animal is so diseased that its carcase is worth nothing."

In cases of dispute as to the use of the flesh of a phthisical cow, it is necessary, according to Gerlach, to have recourse to the arbitrament of a veterinary surgeon who, in such a case, may judge with competence and impartiality. In giving judgment, he should preserve the flesh which there is reason to save, *without endangering the health of man, the consumer.* "When his scientific knowledge does not enable him to separate the noxious from the innocuous, and doubt persists, the expert should admit the existence of danger and, consequently, in such cases decide to *reject* the flesh, maintaining his opinion so long as the innocuousness of the meat is not established."

Johne also maintains that, in order to ensure a good inspection of meat, public abattoirs are necessary, as well as a corps of inspectors composed of veterinary surgeons, well posted up in the scientific work of their profession, and competent in the practical work of inspection.

According to Zundel, meat inspection, in so far as Tuberculosis is concerned, should, in country as well as in town, be a general measure, applied with intelligence, and based on well established facts.*

* "Nature Parasitaire de la Tuberculose." Strasbourg, 1882, p. 14.

Although in southern Germany it has for a long time been the custom to class the flesh of tuberculous cattle in several categories, notwithstanding a strong desire to do so, it has not been possible to replace an empirical by a rational inspection. So long as private interests are, in the general interest, likely to be injured by way of judgment, so long will there be a disposition to sacrifice right to sentiments of indulgence; judgment will be generally in favour of him who is injured, if for the injury he is not responsible.

In order to properly differentiate the flesh of tuberculous cattle which may be allowed for food, from that which cannot be admitted as aliment, it is necessary that in every district there should be a conscientious and independent inspector, or a person specially selected for this duty, whose exclusive function would be the inspection of meat in that district. This would, of course, cause considerable expense, which would have to be defrayed by the Government, the districts, the consumers, or the butchers.

In addition to the expense, there is another difficulty connected with this preventive meat-inspection, and this is a consequence of the sometimes very narrow limit existing between the flesh which is consumable and that which is not. The more or less hypothetical indications met with in medical literature, do not furnish a sufficiently positive basis for the determination of this limit. The possibility of transmitting Tuberculosis through the medium of the milk furnished by tuberculous cows, would lead to the supposition that *apparently localised Tuberculosis does not always consist in alteration in certain organs only.*

(*To be continued.*)

Editorial.

THE PROPOSED VETERINARY COLLEGE FOR IRELAND.

We have before alluded to efforts which are from time to time made towards the establishment of an Irish Veterinary College, and every few weeks letters in favour of the proposal appear in the Dublin newspapers. The idea is to have not only a teaching school, but also to confer upon it the power of granting diplomas. To the establishment of a teaching college, provided it be placed on a proper and efficient footing, and adequately supported, there can be no objection; but that it should also give a diploma, carrying the same privileges as that of the Royal College of Veterinary Surgeons, or any diploma, we consider in every way objectionable, and opposed to all the true interests of our profession. We have now one active and zealous governing body, the duly elected representative assembly of the profession, the Council of the Royal College of Veterinary Surgeons, which has the sole power of regulating the quantity and quality of the examinations, and of thus securing, as far as possible, a uniform standard of knowledge and efficiency, no matter from what school the candidate may spring. The advantages of having one supreme Council would appear to be sufficiently obvious, yet, over and over again, they are, in writings on the subject, quietly ignored, and the general public, being imperfectly informed, is therefore unable to grasp the true state of the situation. A considerable sum of money would be required to start and maintain a veterinary college in Dublin, as suitable buildings and appliances, and an expensive staff of paid professors would have to be provided. As those who are the most ardent advocates of the scheme do not appear to believe it feasible without the assistance of a Government grant, its establishment might be considered somewhat remote, when we remember that State aid has hitherto been altogether withheld from our once struggling profession, which has, however, at last, through its own unceasing exertions and perseverance, become a real power in the land.

The efficient education of our students must ever be an anxious and important subject, and we should strive rather to obtain quality than quantity of teaching schools, so that we may make our final examinations for the diploma much more searching and severe, especially in the practical part; in short, we have pressing reasons for earnestly wishing to raise the general standard of the professional knowledge of those who present themselves for admission to the Royal College of Veterinary Surgeons. The severity of our examination tests has of late years been gradually increased, so much so as to now keep out those who thought the degree of veterinary surgeon one to be easily and cheaply obtained. We must, however, still advance, for we have not by any means reached the final point of excellence. Very many members of the profession now think that, comparatively speaking, we have too many teaching colleges, and that one in Scotland and one in England would be amply

sufficient for the requirements of the country. The proposal for an Irish veterinary college assumes no shape owing to want of funds; but would a sufficient number of students be found in the country itself to support it? Even its advocates doubt this, as is shown by their suggestion that the pupils might obtain the necessary acquaintance with the practical part of their education by attending the premises of eminent veterinary surgeons in the city of Dublin. Would these practitioners, however, consent to give the necessary facilities for doing this? We may almost certainly answer in the negative. It is, we fear, a too common popular error to think that the formation of a few classes, with two or three lecturers, is all that is requisite to constitute a proper veterinary teaching institution, but they who cherish such an idea will soon find that reduced to practice it can only result in disastrous failure. Whenever a proper teaching veterinary college is started in Dublin, it will be found that much more money and other advantages will be necessary than its advocates appear to have calculated upon; in a word, the expenses will be very great, and there does not seem to be much probability of that government aid being extended to it which has, thus far, as before said, been denied to our profession as a whole.

After years of painful effort and much contention, we have only recently succeeded in removing the opposition of the Highland and Agricultural Society of Scotland, and induced it to cease giving its certificates to practise, and we have therefore—happily for progress and efficiency—only one gate of entry to the diploma. To open another door by granting separate licensing power to Ireland would lead to agitation in Scotland for a similar privilege. The ultimate consequence would be that we should have three different diploma-conferring bodies, and then we should, in all probability, witness a competition to see which could attract most students for its own pecuniary advantage by furnishing diplomas after an inefficient course of study and an easy and untrustworthy examination; in fact, this is only what all experience of professional examinations in any avocation would, under such conditions, lead us to expect.

The medical profession is striving in the face of much opposition to obtain one supreme council to control all its diploma-conferring examinations, which great advantage, its more enlightened members are well aware, would immeasurably increase the standard of technical knowledge and efficiency of those who enter it. We already possess this inestimable privilege, which we should diligently guard, for it is one which cannot be used for any selfish motives; it can only be employed for the benefit of the whole country. We have good reason to believe that, with very few exceptions, Irish veterinary surgeons are strongly opposed to the granting of licensing power to any other body than the existing Royal College of Veterinary Surgeons, of which every member, be he English, Irish, or Scotch, possesses an equal vote in the election of the Council. The profession, therefore, should be entirely free from any jealous and mistaken feeling of nationality, which can only result in disunion and disadvantage.

SERIOUS ILLNESS OF DR. FLEMING.

We much regret having to inform the readers of this Journal that Dr. Fleming, Principal Veterinary Surgeon to the Army, has lately been very seriously ill, and although now on the fair road towards complete recovery, it is feared that some months must elapse before he will be able to resume his regular duties.

Of the cause of the illness there can be no doubt. It was brought on solely by excessive mental labour. Those most intimately acquainted with Dr. Fleming are well aware that in addition to carrying on his military engagements, his life is passed in incessant toil, as editor or author of various veterinary publications, or in other ways labouring for the advancement of our profession. Of what he has already achieved in that direction by the sacrifice of time, health, and money, it is needless to speak, and we feel assured that if the good wishes and earnest hopes of the members of the profession, and of numerous other friends, be of any avail, the health of Dr. Fleming will be speedily restored, and his life spared for many years to his family, with whose present affliction we all most deeply sympathise.

M. PASTEUR ON HIS EXPERIMENTS.

A Copenhagen correspondent writes :—"On Monday afternoon, M. Pasteur delivered a very interesting address at the Medical Congress upon Hydrophobia and his experiments of inoculation. The address was delivered in the great festival hall of the university, in the presence of about 1,200 members of the Congress, and was very much applauded. The first part of the address was mostly a repetition of former statements, but at the end M. Pasteur gave some fresh and interesting information. When he had discovered the method of vaccinating dogs, and in this way made a great many insusceptible to Hydrophobia, he requested the French Government to appoint a competent committee to judge of the results. This request was granted by the Minister of Education, M. Fallières. The committee had sent its report to the Minister, and the following were the most important points :—M. Pasteur gave twenty-three vaccinated dogs to the committee. Nineteen non-vaccinated dogs were selected by the members. On June the 1st, contagious virus from a rabid dog was inoculated into two vaccinated and two non-vaccinated dogs. On June the 3rd, one vaccinated and one non-vaccinated dog were bitten by a rabid dog. On June the 4th, one vaccinated and one non-vaccinated dog were bitten by the rabid dog. On June the 6th, the rabid dog died, and contagious virus taken from it was inoculated into three vaccinated and three non-vaccinated dogs. On June the 10th, one vaccinated and one non-vaccinated dog were bitten by another rabid dog. On the 17th, one vaccinated and one non-vaccinated dog were bitten by one of the non-vaccinated dogs, which had become rabid after the inoculation on the 1st. On the 20th, six vaccinated and four non-vaccinated dogs were inoculated by injection into the veins. On the 28th, two vaccinated and two non-vaccinated dogs were bitten by a rabid dog. The following results are given by the committee :—Of the nineteen non-vaccinated dogs three of the six bitten by rabid dogs became rabid ; five of the seven inoculated by injection became rabid, and all the five otherwise inoculated became

rabid. Among the twenty-three vaccinated dogs not one single case of Hydrophobia took place. One of the vaccinated dogs died on July 13th from ordinary disease. Some virus from the dog was inoculated into three rabbits and a guinea-pig, all four animals are as yet quite well, a certain proof that the dog did not die from Hydrophobia. The committee intended to vaccinate twenty dogs, and see if these would show themselves insusceptible to Hydrophobia. M. Pasteur finished his address by stating that animals are proportionally less infected by bites from rabid dogs than from inoculation. He emphasised the remark that his experiments had produced results on animals only, but he considered it most likely—was, indeed, perfectly certain—that if the dog could be made insusceptible to Hydrophobia, the source of that dreadful disease in man would be extirpated, and the great question as to the prophylactic, both for dog and man, would be solved."

MUTILATION OF HORSES' TAILS.

THE fashion of mutilating horses has now become so common that for the heavier kinds of horses required in the army it is sometimes almost impossible to procure a sufficient number without taking some which have been submitted to the injurious operation of "docking." As the military authorities have been advised to reject all such mutilated horses, because of their unfitness for service, the following Horse Guards Order was issued by H.R.H. Field Marshal Commanding-in-Chief on September 1st:—

GENERAL ORDER.—Horses.—As it has been brought to notice that in the mounted services the regulations in regard to the length of horses' tails are not observed, and as horses with short tails are practically unfit for service in the field, where flies are troublesome, the following addition will be made to para. 5, Sec. XI., "Queen's Regulations and Orders for the Army, 1883": General officers, when making their inspections of mounted corps, will ascertain whether these instructions are strictly followed, and they will specially report every instance in which they are disregarded that come under their notice. Horses with short docks are not to be purchased as remounts.

OBSERVATIONS ON RICKETS, ETC., IN WILD ANIMALS.

BY J. B. SUTTON, F.R.C.S., SENIOR DEMONSTRATOR OF ANATOMY, MIDDLESEX HOSPITAL.

(*Continued from page* 188.)

THE APPENDICULAR SKELETON.—The bones are not, as a rule, much affected; the chief changes are to be seen at the epiphysial lines. The growing lines are irregular, but "spongioid" tissue is absent, or very small in amount. Often a distinct layer of fibrous tissue may be observed at the epiphysis. Occasionally the shafts of the long bones present patches of osteophytic bone. Occasionally the periosteum is somewhat thickened, but this is by no means common, and in the majority of cases is limited to the neighbourhood of the epiphysis.

THE AXIAL SKELETON alone may be affected. Then beading of the ribs exists, the peculiar changes at the vertebral epiphyses, and thickening of the skull vault.

Lastly, the disease may limit itself to the skull alone, and occasionally the vault may be thickened without any other part of the skeleton being impli-

cated. The thickest skulls I have yet come across are those from animals in whose skeletons no other trace of Rickets could be detected.

Although the above account of Rickets occurring at puberty shows "hard-and-fast" distinctions between this and the early form, nevertheless every degree of variety may be met with, so that an animal dying from Rickets at an age intermediate to infancy and puberty, would display a pathological condition of skeleton partaking of the characters of the "infantile form" in its *appendicular* skeleton, but of the "later form" in its *axial* skeleton.

The essential point of difference is, that one form in its typical manifestation affects the limbs chiefly, whereas the other attacks, more or less exclusively, the trunk and skull.

The Museum of the Royal College of Surgeons contains a collection of skulls from lions and monkeys, many of which show the thickening of the vault, such as those I endeavoured to describe; though in most of the cases there is no information concerning the other parts of the skeleton, there can be little doubt that the cause of this hypertrophy must be ascribed to Rickets. In all these examples the character of the hypertrophy is very distinctive; instead of the usual arrangement into an outer compact stratum, then a layer of diplöe, bounded on its inner aspect by the vitreous table; the whole thickness of the bony vault is made up of porous, spongy, osseous tissue of uniform character throughout the whole extent.

An Anomalous Form.—Occasionally one meets with a condition of the long bones in monkeys which differs very materially from the variety of Rickets just described. The instances are by no means common, but important nevertheless. In these cases the animals seem near puberty. Their long bones present well-marked epiphyses, the cartilage lines are somewhat thicker than usual, "spongioid" tissue is present in small amount. The compact tissue of the bone shafts is very thin, but often firm and brittle, sometimes presenting bulgings near the middle, as though a bulb had been thrown there. The medullary cavity is very large, and in some cases is bounded below by the epiphysial cartilages, cancellous tissue being deficient or entirely absent; the medulla is diffluent, so that the condition of the long bone is as if it were an elongated nut-shell containing oil. The flat bones are soft, and their edges inverted, the chest deformed, the skull tabetic, and the spine kyphotic.

The only explanation I can offer concerning these cases is—That they may possibly be examples of Rickets occurring in "infancy," and that the proliferated material has undergone fatty degeneration, instead of organising. These cases are interesting, inasmuch as they present a marked similarity to the cases described by Dr. Rehn at the International Congress, 1881, and by Mr. Barwell, in the *Transactions of the Pathological Society*, and others, as examples of juvenile osteomalacia.

The Teeth.—Long ago Mr. Shaw pointed out that in the human subject, one of the results of Rickets was delayed dentition; this he attributed to the diminution of the jaws and large size of the teeth (*Med. and Chir. Soc. Trans.*, vols. xvii. and xxvi.) It was very surprising to find that in very young rickety animals the teeth were always in place, and normal both as to size and number. This is explained as follows:—Monkeys cut their milk teeth very soon after they are born, and many I believe enter the world with some of their teeth already above the gums, so that the temporary dental armature is complete before Rickets has time to manifest its baneful effects.

In examples of Rickets at puberty, the permanent teeth are delayed, retardation being due in all probability to extreme thickening of the dental follicle, which normally is as thin as tissue paper, but in these cases is as thick as the skin of the finger.

RICKETS OF MATURITY.

This variety is the rarest of all. Few instances have come under my notice, and these have been chiefly among the Carnivora, but the French naturalist, Lataste, has made some observations on the subject, which to a certain extent supply the deficiency.

Symptoms.—The most characteristic features of the disease are deformity, paraplegia, loss of teeth, and fracture of the bones of the limbs, due in some cases to brittleness and tenuity of their texture; in other instances fracture results from softening of the bones. The disease attacks every part of the skeleton. The skull is light and porous; when macerated and dried, it becomes as light as cork; the alveolar margins of the jaws absorb, allowing the teeth to fall out prematurely. In some cases the bones in the recent state are soft, and yield easily to a knife, but when these soft bones are dried they become so delicate in texture that they may be crushed into powder between the thumb and finger. In the majority of instances the long bones are brittle, and break easily. Curves are commonly found in the long bones of the limbs. Deformity of the chest is uncommon.

The interspaces of the cancellous tissue are large. In rodents living in captivity, this affection seems fairly common, affecting more particularly the females, and Lataste found that in his specimens the bones were soft, and cut as easily as gelatine.

It should be carefully noted that care is very necessary in drawing conclusions from dried museum specimens. Frequently have I observed bones which were as soft and as flexible as gutta-percha, when recent or kept in spirit, become hard, brittle, and porous when dried for the museum shelves. Hence it is an important point to keep typical examples of bone disease in a moist condition. It appears exceedingly probable that very many of those porous, mortary-looking skulls and bones exhibited in museums as examples of "Osteoporosis" were, when recent, really soft and yielding bones in many instances. That there is some foundation for such an opinion will be shown by some cases now to be described.

Mr. Solly, in his well-known paper in the "Medico-Chirurgical Society Transactions," xxvii., writes as follows:—"I find that Mollities ossium is not confined to the human species: for I have learnt from Mr. Spooner, the Professor of Anatomy at the Veterinary College, that a year or two ago they had some hounds there belonging to Lord Middleton, the bones of whose skeletons were softened, the disease attacking one bone after another. A *post-mortem* examination of the bones exhibited the same morbid appearance I have described as occurring in the human subject—the deposit of red matter and great vascularity of the cancellated and laminated structure of the bone."

The *Veterinarian* for September, 1860, contains a "paper," by Varnell, of the Veterinary College, London, entitled, "A peculiar and unusual disease of the osseous tissue in the horse, resembling, in many of its characteristics, Mollities ossium, Rachitis, Osteoporosis, and fatty degeneration of bone."

In the very careful account given of this specimen, the following facts are of the greatest interest:—The bones generally were so soft that they could be cut with a knife in any direction, with the greatest ease. The cancellous spaces were filled with a red gelatinous substance.

The animals were four and five years old.

The skull is preserved in the Museum of the Veterinary College, London, with some other skulls and bones similarly affected, which, through the kindness and courtesy of Principal Robertson, I have had every opportunity of examining. Mr. Varnell's original specimen was exhibited at the Pathological Society of London, and is described in the "Transactions" for the years

1859-60. The lower jaw is preserved in the Museum of University College, London. Careful examination of all the specimens has convinced me that these bones are affected with "Rickets of maturity," and that the peculiar "osteoporotic" appearance they present is produced by maceration and subsequent drying.

Mr. Varnell, in his very clear account in the *Veterinarian*, distinctly states that "the bones were soft, and could easily be cut with a knife." At the present time these bones present the dry mortary appearance so characteristic of the so-called "Osteoporosis."

Microscopically, these specimens show enlargement of the cancellous spaces and Haversian canals, the latter often being separated from neighbours by a very thin lamina of osseous tissue.

By far the most interesting of these cases is one reported by Paul Gervais, in the *Journal de Zoologie* for 1875. It concerns some bones found near Vienna, which Brandt, in the *Cetaceen Europa's*, 1873, considers to belong to the Cetacea, and names it *Pachyacanthus*. From the figures given by Gervais the ribs and vertebræ present a condition allied to this so-called "Osteoporosis"; but the vertebræ are remarkable, inasmuch as they show a considerable narrowing of the spinal canal, so that the spinal cord must have been much compressed by the obvious overgrowth of osseous material. It was through carefully following this case that I was led to explain the cause of Paraplegia in rickety animals. Before perusing the account of this case the existence of general narrowing of the canal for the cord by bony overgrowth, or softening of the component vertebræ, seemed too strange and novel; but, as has been shown in the preceding pages, the application of information thus gained was crowned with the happiest and most satisfactory result, and has afforded a clear explanation of a symptom, which, though well recognised as such, had never had its cause investigated in a proper way. This narrowing and yielding of the vertebræ throws light on symptoms observed in "Osteomalacia" in the human subject. In this formidable malady, pain is a prominent symptom, and careful examination of the clinical histories of the reported cases shows, that in the majority of cases, pain, agonising in its characters, began in the lower extremities, and in some cases the patients became paraplegic. No doubt, in these cases the yielding vertebræ caused the spinal nerves to be compressed, for the lumbar vertebræ were softened, as proved at the autopsy, and the pain was always increased on movement.

That this condition of cord and vertebræ may be overlooked is easy to understand. So long as I followed the usual *post-mortem* routine and opened the neural canal from behind, I failed to observe the true "state of affairs," but when, on making transverse section of the column, leaving the cord *in situ*, the relative condition of bone and spinal marrow were observable and the condition recognised.

ÆTIOLOGY.

In the human subject there can be no doubt that many things, but no one thing in particular, conspire to produce Rickets. Poverty and hard living are no doubt factors in the case, bad hygienic conditions, unsuitable feeding, and especially depriving the child of the breast-milk of the mother, are powerful causes. Frequent pregnancies, with slight intervals, are predisposing if not actual causes of Rickets in the offspring.

There can be no doubt that the same list of causes operate in producing Rickets in animals. They are taken, many of them when quite young, from the mother, and fed on unsuitable diet; they suffer loss of exercise, and are exposed to the vicissitudes of an English climate.

That unsuitable diet plays a very important part in the production of

Rickets in children and in animals, may be illustrated by two cases. I saw a *post-mortem* on a boy aged five years, who died as rickety as it is possible to imagine a child. The boy's only desire was to be fed on sausages and bread, with gin to drink, such as his miserable parents had been accustomed to give him. That same day I made an examination of a young bear, eighteen months old, with rickety changes in every bone; it had been taken quite young from its mother, and brought up on board ship to eat boiled rice. The two cases were good examples of the vicious effects of improper food.

When a wild animal becomes a prisoner, it is in most cases impossible to provide the creature with that variety and quality of food which it obtains when in its wild state.

Not long ago some fine examples of the babirussa were presented to the Zoological Society; seven months later, a fine male died, with all the bones spongy and soft, as the monkeys' skeletons described in the earlier part of the paper.

Lataste's observations on the gerbilles show in the most conclusive manner that Rickets is a result of captivity, and the longer the animals remained in the captive state the earlier the offspring showed symptoms of Rickets. Gerbilles, born in the desert, then confined in cages, became rickety in two years; but those born in confinement succumbed to the disease in fifty-two days.

Principal Robertson, of the Royal Veterinary College, London, informs me that dogs are often subject to Rickets; and he considers that want of exercise, unsuitable food, and what is termed "in-and-in breeding," are powerful causes in producing the disease.

The case of the gerbilles is a very good example of in-and-in breeding. Then there is the question of frequent pregnancies, weakening the mother, and drawing on her store of lime salts.

A gentleman, who lived for eleven years on the West Coast of Africa, and still resides there, assured me that Rickets was unknown, and that after a woman is delivered of a child she is kept apart from her husband for one year.

Respecting the causation of osteomalacia in the human subject, most observers have pointed out the association of frequent pregnancies with this formidable disease, so with regard to the gerbilles, the females who were most prolific succumbed earliest to the affection.

General Conclusions.

The facts and deductions set forth in the preceding pages have been made from observations on a large number of animals of various species.

Since December, 1881, to the present time, more than two hundred monkeys have been examined *post mortem*. The proportion of Rickets in the last hundred Quadrumana was fifty per cent.; this means that half the animals kept in confinement in this country for any length of time die rickety.

Almost the same may be said of the Carnivora, particularly the smaller species, *e.g.*, cynictis, ichneumon, binturongs, etc. Bears are not exempt from the affection. Rodents suffer greatly, old and young. Instances of the disease occur in birds and in lizards, so that, zoologically, the disease is fairly well distributed.

Reviewing the facts broadly, it is obvious that the forms described as "Rickets of Infancy" and "Rickets of Puberty" are the same diseases, modified according to the normal physiological process in operation at the age at which the perturbation manifests itself—the abundance of material enabling one to set this question definitely at rest.

With regard to the form of the disease occurring at maturity, there can

be little doubt that this is the result of similar causes, the effects being also modified by the altered condition of the skeleton incident to the adult state, and as each of the three phases of life—infancy, puberty, and maturity—is characterised by peculiar skeletal modifications, so do the effects of disease declare themselves in a special manner coincident with the age of the subject.

These facts also go to show that in the human subject "Rickets," "Late Rickets," or "Juvenile Osteomalacia," and "Mollities ossium" are the result of malnutrition, the effects on the skeleton varying with the age of the patient, and though clinically they present different features, nevertheless pathologically they must be considered identical, inasmuch as the fundamental character in all three is perturbation of the physiological processes concerned in the formation, growth, and nutrition of the skeleton. The following table is constructed to show the leading pathological tendencies of the disease according to the age at which it occurs.

Table to indicate the Distribution of the various Lesions according to Age.

	INFANCY.	PUBERTY.	MATURITY.
Skull.....	Soft and somewhat thickened at the vault. Exterior may present a worm-eaten appearance. The base often presents tabetic patches.	Vault is thickened.	Softened generally and eroded.
Vertebræ.....	Spongy and soft, encroach on the neural canal, causing paraplegia.	Present bulgings at the discs and epiphysial plates. Paraplegia.	Soft, spongy, and vascular. Paraplegia.
Thorax	Deformed and beaded. Infractions of ribs.	Beaded. Infractions of ribs.	Nil.
Long bones...	Soft, curved, with large epiphyses. Spongioid tissue reaches its maximum.	Fibrous tissue in a thin layer at the epiphysial line. Spongioid tissue in a minimum degree.	May be often soft and curved, or the compact tissue exceedingly thin and brittle.
Teeth	Temporary set, normal.	Permanent set late in erupting.	Fall out prematurely, due to absorption of the sockets.

Fœtal Cretinism.

The subject of Rickets cannot be passed over without some allusion to a disease which in many points seems to be closely allied to it, yet in other respects is so very different. On account of the resemblance it bears to Rachitis, it has been called "Fœtal Rickets" by some authors, but other pathologists refuse to regard it as such, and consider the affection as being of the nature of Cretinism.

Professor Eberth has written a monograph on the subject, entitled "Die Fœtale Rachitis und ihre Beziehungen zu dem Cretinismus, 1878," and describes a case which he had met with in a calf. Specimens have been investigated by Müller and Urtel. In this country examples of the disease, under the name of "Fœtal Cretins," have been shown at the Pathological Society by Dr. Barlow, Messrs. Shattock, Bowlby, and the writer (see vols. xxxii. and xxxv.).

The subject has been mentioned here, because the disease undoubtedly occurs in animals. In addition to Müller and Eberth's observations on calves, Shattock has drawn attention to a fœtal bitch puppy in the Teratological Series of the Royal College of Surgeons' Museum, London.

It seems to me that, as Rickets is so very frequent in animals, not only Quadrumana, Rodentia, and Carnivora, but it also occurs with tolerable frequency in horses, mules, lambs, etc., it may reasonably be expected that examples of these curious fœtuses ought to turn up now and then if the disease be really due to Rickets occurring *in utero*. So far as I have been able to observe at the Zoological Gardens, none of the young born there have exhibited this condition of the skeleton in the slightest degree, although the number of still-born animals is not by any means small. On the other hand, there are many points in the anatomy of the disease associating it with Cretinism, but there is not a sufficient number of cases on record to enable a true verdict to be given. This fact should stimulate those who have opportunities in this direction, to be on the look-out for cases occurring among mares, ewes, cows, etc., and to have them carefully dissected, described, and recorded in accessible places. Up to the present time I am unaware of any progressive case of intra-uterine Rickets having been observed. Until this be done there is not a tittle of evidence to warrant the "Rickety" origin of these singularly interesting malformed fœtuses of man and animals.

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examples of "Sporadic Cretinism" (fœtal Rickets)? by Dr. Barlow, Mr. Bowlby, and myself. Vols. xxxiv. (1883) and xxxv. (1884) contain my papers on "Bone Diseases in Wild Animals."

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11. *Med. and Chir. Soc. Trans.*, vols. xvii. and xxvi. Mr. Shaw's "Observations on the Effects of Rickets on Head, Face, and Pelvis."

Those who wish for details concerning individual cases of Rickets in animals I must refer to my original papers in the *Trans. Path. Society*, vol. xxxiv. The forthcoming vol. xxxv. contains two papers on the subject, detailing a far wider experience of the disease. All the communications are illustrated by numerous woodcuts.

The *Proceedings of the Zoological Society* for March and April, 1884, contains full details of the disease as it occurs in Carnivora.

Several complete skeletons are exhibited in the Pathological Series of the Museum of the Royal College of Surgeons, and typical examples of the disease are preserved in the Museum of the Middlesex Hospital, and at Cambridge.

Perhaps one cannot do better than close this paper with a quotation from Otto's *Human and Comparative Pathological Anatomy* (South's translation, 1831). It runs as follows :—"As, however, man forms but one link in the chain of organic beings, so for the perfection of pathological anatomy nothing would operate more advantageously than the investigation of the diseased structure of other organic bodies, and particularly those of animals. As soon as we have collected a considerable number of such observations we may expect, in a general view of the vices of structure in organic bodies, to penetrate deeper into their nature and causes. Even now, whilst pathological anatomy, in comparison with most other medical sciences, is only in its infancy, its utility is traced in almost all the branches of medicine. It is the common and absolute source of all, but particularly of anatomy, physiology, and pathology."

ANTHRAX IN INDIA.

REPORT OF A COMMITTEE ASSEMBLED AT BANGALORE, ON 19TH FEBRUARY, 1884, BY ORDER OF HIS EXCELLENCY SIR FREDERICK ROBERTS, BART., V.C., G.C.B., COMMANDER-IN-CHIEF OF MADRAS, TO INQUIRE INTO THE RECENT OUTBREAK OF ANTHRAX AMONG THE GOVERNMENT HORSES AT BANGALORE.

President: Lieutenant-General PAYN, C.B., Commanding Bangalore Division.

Members: Inspecting Veterinary Surgeon F. G. SHAW, Madras Army; Veterinary Surgeon, First-class, W. S. ADAMS, A.V.D.; Veterinary Surgeon J. MILLS, A.V.D.; Veterinary Surgeon F. SMITH, A.V.D.

I.—Memorandum from Inspecting Veterinary Surgeon G. Evans, M.D., sent to the Committee for guidance.

A. The immediate cause of Anthrax is not now a matter of speculation, for nothing is better established in medical science than that the disease is directly due to the introduction into the blood of an organism of the vegetable kingdom known as the *Bacillus anthracis*. It has also been proved, over and over again, that this vegetable organism flourishes in a soil that has been under shallow water for some time and then exposed to the sun; it can easily be artificially cultivated, and it is brought to the surface by earth-worms from the graves of animals that have died of the disease. These are some of the established facts which every intelligent committee will accept, and from them proceed to inquire how is this *bacillus* usually conveyed to the horses? In pursuing this investigation, the food, drink, air, and horse lines flooring should be considered.

B. I have already said that, while the disease is very common and fatal at Bangalore, it is almost, if not quite, unknown at the Remount Depôt, Hosúr, and at Bellary. The Committee should make a special inquiry into the cause which may account for this difference.

C. If the Committee can find, with probable certainty, the most common mode by which the virus is conveyed to the horses, they should next consider the best means of averting it, and recommend whatever change of diet or sanitary conditions which they may deem most efficient and practicable.

Report of the Committee.

1. Accepting the recognised etiology of the disease as an established fact, the Committee now proceed to weigh the evidence before them—evidence collected on the spot by the Committee, from veterinary officers in the Presidency, and from the written opinions of eminent authorities.

2. The three points for investigation are taken in the order given in the Adjutant-General's memorandum.

A.—How the bacillus is conveyed into the organism.

3. On this point opinions are divided. There are advocates for each of the three theories—air, food, and water.

Air.—Can the air convey the poison?

Nageli asserts that fungi can only pass into the air when their nutrient liquids dry up. Soyka has shown that gentle air currents can carry them out of liquids. Buchner, on the other hand, asserts that strong currents of air are insufficient to sweep bacteria from a liquid, and that even in the case of dried-up masses containing fungi, that these can only be liberated if the surface be broken. When it is considered that the weight of a small moist bacterium is estimated at the *ten thousandth millionth of a milligramme*, there is no difficulty in accepting the fact that they may be carried about by the faintest breath of air.

4. The weight of opinion is with Buchner, which the Committee endorse; the following statistics from the Veterinary Report of this Army, dated 26th July, 1883, No. 439 (Military), showing the number of fatal cases from 1868 to 1883, inclusive, give strong support to this theory, as may be seen on referring to the subjoined table:—

Stations.	Total cases of Anthrax in the years ending March															
	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	—
Saugor	—	..	..	—	..	..	..	..	..	..	..	2	..	..	..	..	2
Kamptee	..	..	..	..	3	..	4	1	2	..	..	..	..	..	10	5	25
Secunderabad	38	10	—	..	2	..	2	..	—	..	..	..	..	..	5	..	57
Bellary	—	..	..	1	—	—	..	..	..	..	..	..	..	..	..	..	1
Bangalore	48	45	11	7	5	3	4	47	17	2	..	1	..	..	1	15	206
Trichinopoly	..	..	..	..	..	..	7	6	..	..	..	..	..	..	..	..	13
The Mount	—	9	..	1	12	12	12	14	2	4	..	..	1	2	2	2	73
Madras	—	1	..	..	—	2	..	1	..	..	1	3	..	..	..	..	8
Thayetmyo	..	..	..	—	..	23	3	..	..	5	4	..	..	..	..	..	35
Total	..	96	55	11	9	22	40	32	69	21	11	5	6	1	2	18	22	420

On referring to the years 1875-76, we find that ninety fatal cases of Anthrax occurred in the Presidency, during which time (the famine years) the rainfall was below half average, when the soil was for the most part in that condition mentioned by Buchner as favourable to air poisoning.

Bangalore and the Mount suffered most during these years, which lends strength to this theory; but, on the other hand, we find that Bellary, though placed under identical conditions, had not a single case of Anthrax. However, in 1876 occurred a virulent case at the Remount Depôt (Hosúr).

5. The Committee can only conclude from this that the poison may be conveyed by dry air; particularly so when charged with dust, which is capable of being conveyed to great distances. Veterinary Surgeon Going also informs us that his cases at Bangalore, during these years, were principally those affecting the respiratory organs, as was that which occurred at Hosúr, evidence presumptive of air infection.

6. We have so far only considered the air in a dry state, and have now to deal with moist air.

7. Evaporation is constantly present in India. Heat and moisture are necessary for the development of the spores which produce the disease, and these are carried upwards by the process of evaporation and disseminated.

Nageli says that the condensed watery vapour of the atmosphere maintains the buoyancy of bacteria, and that friction likewise retards their fall. It is fully recognised that the bacilli of malaria are carried up into the air from marshes, and are similarly disseminated. We therefore conclude that moist air from an infected spot can convey the disease, and this is accepted at the Cape as the ruling or common cause of horse sickness (Anthrax).

8. Inspecting Veterinary Surgeon Lambert and Veterinary Surgeon Healy both note this condition of atmosphere as productive of the disease in that country, and it is worthy of remark that nearly all the opinions collected from veterinary surgeons in the Presidency note the damp, moist, or steamy condition of the atmosphere during the period of outbreak; these conditions were present during the outbreak in the cavalry brigade camp at Krishnarajpuram in January, 1884.

9. It would appear from the local inquiries made by Messrs. Adams and Smith (at Bangalore) that three-fourths of the cases which they were able to collect from available records occurred in the latter half of the year, *i.e.*, from July to December, and from the statistical report of this and other stations, it would likewise appear more prevalent in these monsoon months

and while the land remained damp after the rains. It must be borne in mind that the whole of the stations of this presidency, with exception of Kamptee and Saugor, are visited by both monsoons in a greater or lesser degree.

10. We have now to consider the probability of the air, under the conditions noted above, being the origin of the disease in Bangalore. There is strong presumptive evidence that the outbreak in this station in December last was attributable to atmospheric cause. In this outbreak the virus would not have been conveyed in its dry state, as at this time the surrounding country would have been still moist from the recent monsoon, the tanks full, and wet lands covered with water; but from the great evaporation taking place under this condition, there would be ample moisture in the air to hold in suspension the germs of *bacillus anthracis* arising from any tainted spot in their most infective state. The outbreak was not localised, but attacked simultaneously (or within twenty-four hours) the horses of I Battery, 3rd Brigade, Royal Artillery, S Battery, 1st Brigade, Royal Artillery, and the elephants of the transport, pointing conclusively to one and the same exciting cause. These lines were situated in a direct line with the prevailing wind (E.N.E.) That the animals were not absolutely simultaneously attacked may be accounted for by the probability of the period of incubation being longer or shorter according to the constitution of the animal affected. From what infected spot the atmosphere derived the spores it is, of course, impossible to trace.

11. We have equally strong reasons to adduce in support of both conditions of the atmosphere—wet and dry—being favourable to the development of the disease; as, for instance, the heavy mortality during the famine years, and the almost total absence (three cases) of the disease in the wet years that followed, 1877, 1878, 1879.

12. From the above, it would appear that there are atmospheric conditions that will convey the virus in both wet and dry weather, and apparently under identical conditions in other years the disease does not occur. This would appear to be particularly the case as shown in the table, from which it would seem that Anthrax, like Cholera, visits us in cycles of years, the laws ruling which yet remain a mystery to medical science.

13. WATER.—There can be no doubt that water is a means of conveying the disease, and it may be contaminated by all or either of the following causes:—

1st.—Direct pollution by diseased animals.
2nd.—Surface drainage from infected country.
3rd.—Conveyance into it of spores by atmosphere.

Of these three probable causes, we think direct pollution to be the most common.

14. The Government horses at Bangalore are exceptionally treated with regard to their water-supply, for with the exception of the 1st Light Cavalry, they are all given the Ulsoor tank *filtered* water in the same state as supplied to the troops. However, this water has been generally suspected by the medical authorities as a source of Typhoid Fever, and there is no doubt that it is open to pollution by cattle, etc.

15. That coarse filtration does not rid the water of bacilli is well known; but were the water a source, we would expect to hear of cases of Anthrax among the troops, as the human subject is well known to be liable to the disease.

16. It should also be remembered that the water, after it has reached the lines, is open to pollution, either in the reservoir, as per cause 3, or in the watering troughs, as referred to in para. 38 of the Local Investigation Report.

In the case of the water of the 1st Light Cavalry, which is obtained from a tank close to their lines, pollution is more likely to occur from the amount of surface drainage, its proximity to the public road, and from dust and rubbish which is conveyed into it by the wind.

17. The outbreak of the disease in the cavalry brigade camp at Krishnarajpuram would almost point to the water being the source of infection, as is shown in para. 23 of the Local Investigation Report. The horses of E Battery, B Brigade, Royal Horse Artillery, 12th Royal Lancers, and 1st Light Cavalry (in each of which there were cases of Anthrax), were watered from a certain tank, while the horses of the 2nd Light Cavalry, which were watered from another source, escaped. It should be mentioned, however, that the Mysore Silladar horses were watered from the first-mentioned tank, but were not attacked.

18. We would here draw attention to the fact that the first case attacked was a horse of E Battery, B Brigade, Royal Horse Artillery, which had only arrived in camp from Bangalore three days previously, and it is quite possible he had the germs of the disease in him on arrival, for we find that he had been picketted in close proximity to a shed in which three horses had died from Anthrax during the previous two years.

19. Though attaching due weight to the outbreak at the cavalry brigade camp at Krishnarajpuram, and the probability of infection from the tank water, we nevertheless do not think that the disease can be traced to that source, but it is quite possible that the horses may have brought the infection with them from cantonment, where it had raged a few weeks previously.

20. After due reflection, we do not think that the water has been responsible for the disease as it occurs at Bangalore.

21. SOILS.—The soil is undoubtedly, and, on the best authorities, the chief habitat of bacillus germs. Koch shows that surface soils and moulds are extraordinarily rich in bacterial germs, but as we go deeper, the micro-organisms diminish rapidly. That at the depth of a metre (3 feet 3⅜ inch) they seem entirely absent. This point is generally accepted.

22. Given therefore the presence of *bacillus anthracis* spores in the soil, we find that certain conditions are necessary for their development. These conditions are a proper temperature, the presence of organic and inorganic matter, and a free supply of oxygen. The best temperature for their development is 77° to 86° F. Formation of spores does not occur below 59° F., and only with great difficulty below 64·5° F. The temperature of soils varies at different seasons of the year, and at different depths. We have no accurate records of the temperature of Indian soils, though experiments have been made on this point at Calcutta.

23. Koch states that no spores are found in the bodies of animals buried more than a metre deep, for the reason that at that depth the temperature for the development of spores is not high enough, and there is an absence of a free supply of oxygen.

24. The organic constituents of soil necessary to the development of *bacillus anthracis* are derived from animal and vegetable matter, such as dead moist grasses, plants containing starch, etc., which afford the necessary carbon and nitrogen for the nutrition of these bodies.

25. The inorganic substances are derived from soils containing sulphur, phosphorus, magnesium, and potassium.

26. The injurious effects of sulphates in hastening organic decomposition have been noticed, while the presence of lime in the sub-soil is a necessary condition for the development of these spores. All the conditions enumerated above we find present in the cantonment and surrounding country of Bangalore (as also, indeed, it must be acknowledged, in most parts of India), and we have to consider how the soil and its poisoned products may be conveyed

to the horses. This is undoubtedly through the medium of the grass, air, or water—one or all. The former we shall deal fully with under its proper heading, the air and water we have already noticed.

27. Before closing the subject of soils, we feel bound to mention the fallacious "earth-worm" theory of Pasteur, which is now clearly demonstrated by Koch to be "unnecessary and erroneous."

28. FOODS.—We are fully alive to the importance of the consideration of this mode of conveyance of the disease, and under this heading we have to consider a variety of media by which the virus may be conveyed to animals in grass and other forage.

29. *Grain.*—We might almost dismiss this item at once, because it is fair to presume that the grain food, as supplied to the horses, does not primarily contain the spores, or, if so, the process of boiling and subsequent steaming would certainly render them inert.

30. The Transport bullocks at Bangalore, we understand, are fed on *cooltee*, which is soaked in cold water, but Anthrax has not appeared among them.

31. *Grass.*—We have abundance of proof that grass can convey the disease, for it is a well-known fact that grass impregnated in any way with the spores of Anthrax will, on introduction into the system, give rise to the disease. We have experimental proof that this is correct, and we know that certain grasses and soils form suitable media for the growth of these organisms.

32. We are told that sandy or silicious matter in the grass, by causing wounds in the digestive track or injuries within the mouth, would render infection more liable by permitting the entrance of the spores of the *bacillus anthracis* into the circulation, and we are also informed of experiments which have been made to prove that, unless there is a broken mucous surface, infection cannot result. We, however, do not consider that a broken surface is absolutely necessary for infection, but that the open mouths of the many hundreds of intestinal glands and follicles will alone afford a ready entrance of the spores into the circulation.

33. From the mode of collecting the grass, and the localities from which it is brought, it would seem at first sight to be not only a probable, but a sure source of infection, for we gather that Anthrax is scarcely ever absent from among the cattle in the district, and the surrounding country is infected by the carcasses of horses, bullocks, etc., that have died for many years past, thus affording numerous *foci* for its spread.

34. There are other means by which grass may be infected; for example, superficial burial of anthracoid carcasses, and the generation of spores which are taken up in the grass roots and earth adhering thereto; the flooding of lands carry along with it the spores or rods from infected places; the pollution of grass and soil from the excreta of animals suffering from the disease, or from manure carted from cantonment, or from cattle-pens where the disease may have existed; grass washed in infected pools, and grass cut on lands on which the spores may have been deposited by the air.

35. Grass cut from below the surface, we think, would be more likely to convey the disease than that cut above, although that growing above the soil is by no means free from infection, as we shall show later on when dealing with hay.

36. While placing all due weight on surface contamination from diseased carcasses having been thrown on the soil, it is very important to notice, tending to detract from this source of infection, that in Secunderabad in the years 1868 and 1869, forty-eight carcasses were thrown on the soil, *and yet in the succeeding twelve years only four cases of the disease occurred.* We notice the same thing at Bangalore, for in the years 1868, 1869, 1870, 104

carcasses were similarly disposed of, and yet in the succeeding four years only nineteen deaths occurred. We should naturally have expected from this surface pollution an increase, instead of a decrease, in the number of cases. The same remarks apply to other stations.

37. *Hay, rumna grass, ragi-straw, paddy-straw, cholum, etc.*

38. Taken all together, these are less liable to sources of infection and pollution than grass-cutters' grass, in that they are produced on cultivated and higher lands (excepting paddy-straw). In Bangalore and Ooscotta, hay is largely cultivated as an industry, and finds a ready market in the Commissariat and private stables. Bangalore may be said to possess advantages over other stations in this respect.

39. Hay at first sight would appear to be above suspicion, but we have evidence to the contrary; for, in the *British Medical Journal* of 4th September, 1880, Professor Law writes:—

"I have further known pastures, in which Anthrax had been developed for the first time in the memory of the inhabitants, maintain their infecting qualities for six years in succession, and to yield hay which continued to infect animals when fed to them at a distance from such pastures."

40. As a probable source of hay infection, we would note that the manuring of land with material from infected places would undoubtedly convey the disease.

41. The Committee would now notice a very important fact in connection with the bacillus producing Anthrax.

It has been shown, by careful observances, that the *bacillus anthracis* may be cultivated from the *bacillus subtilis* found in hay infusions; that the one under certain circumstances may be converted into the other. This theory, although strongly opposed, is gaining ground with reference to other specific diseases; but it is now generally believed that a transformation may occur in germs, and that what was at one time a non-disease-producing germ may, under certain circumstances, become a virulent organism.

42. The *bacillus anthracis* has been obtained from the *bacillus subtilis* which is found in hay, and in a recent number of the *Nineteenth Century* there is an article by Dr. Carpenter, in which we find the following remarkable paragraph:—

"It is a fact of great significance that the malignant *bacillus anthracis* of *charbon* does not differ morphologically in any important character from the innocent *bacillus subtilis* of hay infusion, and although it has not yet been certainly shown that any method of treatment can give to the latter the potency of the former, yet it seems not improbable that such may be the case. With Dr. William Roberts, I see no more difficulty in believing that the *bacillus anthracis* is a 'sport' from the *bacillus subtilis*, than in believing (as all botanists tell us) that the bitter almond is a 'sport' from the sweet almond—the one a bland and innocuous fruit, and the other containing the elements of a noxious poison."

43. In support of the above, we summarise the portion of a leader which appeared in a recent number of the *Medical Times and Gazette.*

As far as our means can demonstrate, it has been proved that the *bacillus anthracis* of Splenic Fever is the same organism as the *bacillus subtilis* which flourishes in vegetable putrefactions. A series of cultivations made by Buchner, in which the condition of pabulum, oxygen supply, and temperature was gradually modified, converted the *bacillus anthracis* into the harmless *bacillus subtilis*, and the *reverse process has been effected.* Koch refuses to admit these conclusions, chiefly on theoretical grounds.

In these days of Darwinism, it needs no preface to prove the proposition that all parasitic organisms are necessarily derived from closely-allied non-parasitic forefathers. The adaption must have been a gradual one, and

there can be no doubt that disease-producing *bacteria* have been, at some time or other, derived from non-disease-producing *bacteria.*

Moreover, it seems probable that disease-producing *bacteria* have an intermediate phase of existence external to their host.

"It cannot be shown, for instance in the case of *bacteria anthracis*, that the bacteria are passed direct from host to host; apparently they exist widely spread on the surface of the earth. In this widely-spread non-parasitic condition it is probable they are harmless as *bacillus subtilis*, that only here and there, from time to time, when definite conditions occur, such, for instance, as the admixture of animal fluids, blood, etc., with the most usual constituents of the soil, do they gradually, in those particular spots, undergo modification and become adapted to take the last step and enter on a parasitic and disease-producing phase of activity. This offers an explanation not afforded by the fixity of bacteria—(1st) the importance of organic refuse in breeding disease; (2nd) of the apparently spontaneous outbreak of zymotic disease (really the acquirement of parasitic adaption by species of bacteria present generally in a harmless state); (3rd) of the paradox that, according to the fixity theory, millions of these pathogenic bacteria must everywhere be diffused in a state ready for active infection, and yet men and animals are not habitually attacked by them, but only at intervals of time and place so as to cause what are known as epidemics."

The intermediary vehicle in Anthrax seem to us the important point to determine, and without carrying this theory to extremes, it seems probable that pathogenic bacteria may have a free living harmless phase of existence.

44. *Now with such authorities as these, we may simply ask the question, whether the bacillus subtilis found in grass can, through becoming converted, give our horses Anthrax? This is of vital importance, for if so, neither preserved lands nor carefully gathered hay will prevent the disease invading us.*

45. The Committee is not prepared to say what the changes are that are necessary for the conversion of the *hay bacillus* into the *Anthrax bacillus*, but they would note as a not improbable cause the fermentation which occurs in a wet bundle of grass.

46. *Rumna grasses.*—These we may dismiss in a few words, as far as Bangalore is concerned, for they are little used owing to the better kind of hay cultivated.

47. *Ragi-straw.*—This we do not look upon as a source of infection *per se*, but only liable to become so by direct pollution; especially would this be so whilst being thrashed by bullocks.

48. *Paddy or rice straw.*—The principal use of this is amongst Commissariat cattle as a fodder, and to troop horses as bedding. Among the Government bullocks we have not traced any disease, though the straw is a product of wet lands, which we know to be favourable to the development of *bacillus anthracis.*

49. *Cholum.*—This is a cattle and elephant fodder, and unlikely, from its height from the ground and cultivation, to be infected; yet it is noteworthy that the elephants of the Transport and horses of I Battery, 3rd Brigade, Royal Artillery, which were severely attacked during the last outbreak at Bangalore, were receiving this as a supplementary fodder, but the horses of S Battery, 1st Brigade, Royal Artillery, which did not partake of the cholum, were simultaneously attacked with the disease. From the above, we argue that the cholum was not the cause of this outbreak.

50. *Tank grass, sedge.*—This is exclusively an elephant fodder. The Transport elephants were thirteen days in Bangalore before they were attacked, during which time they had not received any tank or sedge grass which appears to have been their principal fodder at Toomgoondall, the

elephant depôt. Theoretically, we should look to this fodder as a most probable vehicle for the conveyance of the bacillus or its spores, but a fairly long period had elapsed between the time it was used as a fodder and the attack, and since their return to the depôt, and to this grass, no fresh cases have occurred. We fail then to attribute the outbreak to this source.

51. *Lucerne.*—This is an exceptional food supply to Government horses, but it is cultivated, to a limited extent, by some regiments and batteries in certain stations as a supplementary or sick diet; we mention it here as bearing on the question of probable infection, for we find there is a lucerne garden kept up by the E Battery, B Brigade, Royal Horse Artillery, at Bangalore, which is on the site of the old Native Horse Artillery horse lines, in which lines a very virulent outbreak of Anthrax occurred in 1869. These lines were left vacant for five years, and the garden was started ten years ago, we have thus an interval of fifteen years from the year 1869 to the recent outbreaks. From the length of time that has elapsed and from the fact that the fodder is cut a few inches above the ground, we are not inclined to look on it, at this distant date, as a source of infection, but we have no data to guide us in our opinion as to the length of time land may retain its infective properties. We would here draw attention to the fact that the horses of the 12th Lancers do not get lucerne, and this regiment has suffered severely with Anthrax since its arrival at Bangalore.

52. *Summary on the above.*—So much weight is attached to grass as a means of conveying the disease, that we think we cannot do better than give the evidence for and against this agent.

In favour of grass we have the important fact that the disease has been traced directly to this agency. We know that by whatever means spores are carried into grass or fodder, that such fodder is likely to give the disease. We reasonably suspect grass from the fact that it is cut anywhere, subject to all pollution both before and after gathering, and that direct experimental investigation has proved all these points beyond a shadow of doubt. On the other hand, we have certain evidence which tends to weaken the grass theory; for instance, we have detailed the important fact that, after large outbreaks in previous years, the disease was practically absent for some years following; whereas, if grass and soil pollution, which did occur, was a prolific source, the disease, instead of decreasing, would have multiplied itself every year on account of there being more centres of infection. Again, there are other stations in India where the grass is gathered just as in Bangalore, but in which Anthrax seldom appears. Madras grass is for the most part cut at Pallávaram, the Mount grass from the same place. Yet one suffers severely, and the other (according to returns) but mildly. However, the most telling evidence is the important fact that the hack-gharry horses at Bangalore, which receive grass cut from anywhere, soaked in any pool, worse in quality than that supplied to troops, do not suffer from the disease Of this we are assured—*vide* paras. 77-83 of "Local Investigation Report."

This startling fact carries the more weight when we consider that the germs of this disease are spread over the surrounding country. The civil horses in Bangalore exist in greater numbers than the military; they receive worse grass than Government horses, and yet the disease is rarely known amongst them. We could have no stronger evidence than this against the grass, for here we have a number of animals placed under identical conditions as regards climate, soil, and food; with one the greatest care is exercised with respect to the grass; they are well-fed, clothed, and cared for, and yet the disease is practically never absent from amongst them; with the other, which receive the greatest filth as grass, are under-fed, over-worked, and often living in the dirtiest of stables, we find that the disease is

practically unknown. Neither air, soil, nor surroundings can be urged in favour of this comparative immunity, for all are of the worst description.

The following extract from an article published in the *Nineteenth Century* by Dr. Carpenter, on the *Germ Theory of Disease*, may offer a possible explanation of the immunity of the hack-gharry horses in Bangalore from Anthrax :—

"All the predisposing causes of epidemic diseases may be generalised under one expression, the accumulation of decomposing nitrogenous matter in the blood, either from its introduction from without (foul air, impure water, or putrescent food), or through its excessive generation within the body, as by an unusual waste of tissue, or by an obstructed elimination of the normal waste, such as results from bad ventilation or the misuse of alcoholic liquors."

"Zymotic poisons which have no action on pure blood will, by seizing on this *appropriate pabulum*, increase and multiply in it."

The hack-gharry horses, from their regular work and short feed, have at no time any excess of nitrogenous material in the blood, in fact the amount is barely sufficient for the expenditure in the work exacted from them ; thus the blood is never in that state described as an *appropriate pabulum*.

Anthrax is also very rare among horses in private stables in Bangalore. These horses are regularly worked, although well fed, and the equilibrium of supply and waste is nearly maintained.

Prolonged and weakening exertion in animals not in "condition" for such work, would necessarily cause an unusual *waste of tissue*, and throw an excessive amount of nitrogenous matter into the blood. This may possibly account for the mortality from Anthrax, which was so marked after exertion, amongst the horses of the 1st Madras Light Cavalry during the Camp of Exercise.

53. STABLES, HORSE LINES, ETC.—By a reference to para. 21, under the head of "Soils," we find that all the conditions there noted as being favourable to the growth of *bacillus anthracis* are present in stables and horse lines.

That the source of infection is sometimes in the horse lines we have strong presumptive evidence. The case of the mortality in the shed of the E Battery, B Brigade, Royal Horse Artillery horse lines (*vide* para. 45 of local report) ; also the extraordinary mortality in No. 1 sub-division of the same battery (*vide* para. 41 *idem*), and the instance of cases occurring in horses occupying the same picket on two consecutive years (para. 46), and the localised mortality in the A troop, 12th Royal Lancers, all point to some local source of infection.

54. That this does not always exist we have abundant evidence, of which nothing could be stronger than the fact of the 16th Lancers having been severely affected during the first two years of their occupying quite new troop stables (para. 5) ; but we must here note that one fatal case occurred in this regiment the month prior to occupying the new stables. It will also be necessary to point out that at this time the disease was by no means localised in that regiment, or even in Bangalore, but it was prevalent at the same time in Secunderabad, and to a lesser extent at Kamptee and at Hosúr.

The 1st Light Cavalry had occupied new open lines for only twelve months, when they were attacked, and the same regiment had a large mortality from Anthrax lately, whilst daily on the move at the Camp of Exercise at Krishnarajpuram.

55. DISPOSAL OF MANURE.—This is always a difficulty in stable management. It is customary at Bangalore to dispose of the manure to contractors who cart it away at frequent intervals ; at the time the lines were visited there

was no accumulation, but we find there is a place for general deposit of stable manure and barrack sweepings situated about 400 yards south-west of the Field Battery horse lines, in which lines the horses suffered heavily during the recent outbreak. We cannot of course overlook the fact that manure may be a source of infection, and we would draw attention to Mr. Gunn's remarks touching this subject.

We notice also in a very recent article in the *Medical Times and Gazette* the importance of organic refuse in breeding disease; this is referred to under heading *Hay*.

56. BITING AND STINGING INSECTS.—These may be, and probably are a direct mode of infection by inoculation.

57. HORNS, HIDES, ETC.—Bangalore is a large centre of trade where such are collected and forwarded to the coast for export. It is quite possible that this industry may be a means of introducing the disease, but we have no direct evidence to lead us to this conclusion.

58. SLAUGHTER CATTLE.—We find from inquiry that there are approximately about 100 beasts, and a correspondingly large number of sheep, daily slaughtered in the slaughter-houses in Bangalore, but there does not appear to be any professional supervision or inspection either before or after slaughter.

Considering the amount of disease (*vide* Cattle Inspectors' Reports) shown to exist among the cattle in the neighbourhood and surrounding country, we cannot too strongly urge the necessity for proper professional supervision with a view to check the introduction of diseased animals into cantonment; to render this effectual, it would be necessary to inspect all animals for slaughter at a given place without the limit of Bangalore.

59. With regard to the disposal of offal, the question is an urgent one, as in case of disease there could be no more effectual means of distributing infection than by this agency. We lay great stress on this point, for we find that the offal from the Government slaughter-house is deposited within a mile south-east of the Agram barracks, and though it may be argued that Anthrax has not been produced in man, and that consequently the carcases from which the offal was derived could not have been anthracoid, yet this immunity is probably due to the fact of the meat having been cooked. As a prophylactic measure, we strongly advise the destruction by fire of all offal, which should not be utilised as manure, as is at present the case.

60. With reference to the last paragraph, we would draw special attention to the extract from the *Medical Times and Gazette* under the heading *Hay*, which clearly shows the action of decomposing organic matter in the production of zymotic diseases.

B.—THE COMPARATIVE IMMUNITY OF BELLARY AND HOSUR.

The following papers on the subject by Messrs. Adams and Shaw, and the Cattle Disease Inspectors' reports are appended.

Veterinary Surgeon Adams states:—

The disease (Anthrax) is not entirely unknown at the Remount depôt. There was one sporadic case in the year 1876, and a second in 1879. Mr. Shaw informs me that he is positive that, during his residence at the depôt, there were several cases of Anthrax, but they were not recognised as such.

2. It is difficult to attribute this comparative immunity amongst the horses to any difference in the stable management. I have now seen all the batteries and regiments, as well as the Transport cattle and Silladar horse at Bangalore; I am therefore able to compare the systems.

3. At the Remount depôt, when the purchasing is finished, the whole of the stables are filled, and the horses in excess of the number of stalls are

necessarily picketted outside, on open pickets. Up to last year, when the fresh horses were landed earlier, there has always been a period between the issue of remounts to the service and the arrival of fresh horses; the pickets and the majority of the stalls were then vacant; this gave ample time for cleansing and repairing. The outside pickets were often not occupied for more than six months of the year. Although there have at times been large numbers of horses at the depôt, the lines are so spacious, and each set of lines so widely separated, that there is no crowding. The depôt surroundings are very clean, the paddocks, etc., being exclusively used for the cultivation of forage.

4. The stalls are made of gravel and clay in the proportion of one part of clay to two of gravel; this, after being well wetted and rammed down, is tamped till it is perfectly dry. Flooring thus made is quite impervious, and if made with care, will not break up. This system has only been introduced during the past few years, prior to which the stalls were made with the best gravel, but they did not stand long and needed constant repair. Each stable has a urine drain running in front of the stalls, which is flushed and swept twice daily, so that there is no standing of urine in or about the stalls.

5. The system of grass-supply has been in vogue for a great number of years. The forage ration is mixed, and varies according to the supply procurable.

There is no establishment of grass-cutters, but contractors agree to supply the best grass procurable for a certain price and in quantities as required.

This system has great advantages; the first is that horses are ensured a full ration of the best grass; secondly, that as villagers usually supply the contractor, the grass is generally obtained from cultivated land, and not scraped up from waste lands and nullahs, to which the regimental grass-cutters are driven.

Since the number of horses at the depôt has been reduced during the greater part of the year, the entire grass-supply is obtained from lands within the depôt limits.

6. Hay is grown on the paddocks of the depôt, and is issued in no fixed quantity, but according to the quantity and quality of the other forage.

A proportion of green lucerne is also issued with the daily ration, the amount depending on the season. Chaff cut either from oat hay or from dried lucerne is mixed with the feed.

7. The water is obtained from several wells within the depôt limits, and is of excellent quality.

8. It has always been the endeavour to keep the depôt as free as possible from intrusion of cattle, ponies, etc., and at present special attention is being paid to this point.

9. That Anthrax often prevails amongst the cattle in the neighbourhood of the depôt I know from personal observation; a severe outbreak occurred in 1879, and a case occurred in a calf absolutely born in the depôt and never out of it. If, therefore, we are to look to the grass as a probable source of infection, the horses at the Remount depôt would appear to be similarly liable, but perhaps to a less extent, for the reasons above mentioned.

10. The climate of Hosúr is very much the same as Bangalore, for it is on the Mysore plateau and within a few feet of the same level above the sea; it is, however, nearer the ghâts, and there is not so much vegetation at the depôt as in Bangalore. The meteorological conditions would appear to be about the same, for the two places are affected alike by the same monsoons, and I believe the average annual rainfall is about the same, as are likewise the geological features of the country.

(Signed) W. S. ADAMS,
Veterinary Surgeon, 1st Class.

Inspecting Veterinary Surgeon Shaw states:—

With reference to para. 1 of Mr. Adams' remarks regarding the comparative immunity of Hosúr to attacks of Anthrax, I can only draw on my memory in support of what he says when quoting me.

2. Shortly preceding the outbreak of Anthrax among the horses of the 16th Lancers in 1868, I had two deaths in the Remount depôt, and as they agreed in *post-mortem* lesions and symptoms with those of the 16th Lancers (described to me in a letter from the late Mr. Richardson, the veterinary surgeon of that regiment, asking me to assist in a diagnosis of the disease), it occurred to me it was identical with what I had seen at Umballa in the 9th Lancers and Native Cavalry horses at that station in 1851, and known as "Loodiannah Disease" or "Fever." Further inquiry on the part of Mr. Richardson led him to identify the disease as such, and he changed the name from "Epizootic Fever" to "Loodiannan" Fever, and since by other veterinary surgeons to "Malignant Fever." Notwithstanding the attention Mr. Richardson bestowed on the subject, and inviting inquiry from the profession generally through the means of our (then) only journal, the true nature of the disease was not fixed or known as Anthrax among us until 1871-72, and its correct etiology some years later.

3. Here, then, we arrive at the identification of Loodiannah as Anthrax.

4. I have purposely digressed to show how we have so long groped in the dark.

On the continent of Europe it has long since been known for its specific character. In Asiatic countries it has been known as a form of plague for centuries. In the British Isles we have it (though to a lesser extent than on the continent) under various names in the different animals, such as "quarter-ill" or "evil," "braxy," and carbuncular Erysipelas, but we were not taught to accept its specific nature or true type, as the French and Italians appear to have done under the names of "Charbon" and "Typhus Charbon" till later years.

5 Now we are wise after the event, and I can hark back in memory to at least a score of cases which came under my notice at Hosúr among the Government horses, extending over a period of about eighteen years' service there, never as an epizootic but sporadic. It cannot, therefore, be said of Hosúr that it possesses any special immunity. I know it to have raged as an epizootic in a village about thirteen miles from the depôt, when the cattle died in hundreds. A few *post-mortem* examinations made at the time revealed all the lesions peculiar to the disease, but I could only name it then as "Cattle Plague."

6. The Cattle Inspectors report that Anthrax does exist at Hosúr, and I cannot but think that the statement about its comparative immunity has no foundation in fact. Mr. Adams, in his remarks, has fully entered into the system of stable management at the reserve depôt, which is very much the same in practice as it was in my day, and as near as possible identical with that among Government horses at Bangalore, with, perhaps, a little more artificial green fodder, lucerne, guinea grass, etc.

7. I may remark, however, that the system of watering the horses differed during the early part of my residence at Hosúr, when it was the practice to water the horses from tanks during all seasons of the year, and it is quite possible this may account for my having more cases than Mr. Adams has had.

8. The flooring of the stalls at Hosúr is better and harder than those at Bangalore, and I think worthy of being adopted throughout the Presidency. With the above exception, and, perhaps, a trifle more hay forage, supplemented with grass cut from their own paddocks, I see no difference in soil, climate, grasses, and general surroundings to Bangalore, from which it is distant in a direct line about eighteen miles.

9. The grass contracted for, if in any way superior to the Bangalore grass, is only so owing to there being fewer horses and greater selection at Hosúr, where there are, roughly speaking, about 500 horses; at Bangalore about 4,000.

10. Bangalore is a centre of trade, much of which is carried on by bullock carts of the country. Hides, horns, etc., are collected and despatched to Madras by rail; the live-stock trade for slaughter to supply troops and population of so large a town would, of course, be a means or channel for importation of the disease—points, it must be admitted, sufficiently cogent to account for Bangalore being more open to infection than Hosúr.

(Signed) F. G. SHAW,
Inspecting Veterinary Surgeon, Madras Army.

In considering the difference which exists between Bellary, Bangalore, and Hosúr, we must take into account—

1st.—Climate.	4th.—Forage supply.
2nd.—Soil.	5th.—Water.
3rd.—General surroundings.	6th.—General health of the horses.

1st.—Bellary is hotter, drier, and at a lower sea-level than the other two stations, and the climate more equable throughout the year.

2nd.—The soil is chiefly "black cotton" (regar) with a substratum of lime, and is impregnated with salines, among which is chloride of sodium (common salt).

3rd.—From the Cattle Inspectors' report it would appear that Anthrax is very rare among cattle, and they could only trace two cases in the vicinity of the cantonment within the last three years. This fact is borne out in the official agricultural returns for this district, and we find a corresponding clear bill of health among the Government horses—one death (from Anthrax) in thirteen years.

4th.—The grass is obtained in the usual manner, and at certain seasons of the year (rains) a good supply of *hurialí* can be obtained, but during the hot and dry months a coarser kind of grass is brought in from the Koppah mountains. The only conclusion we can draw is that rumna grass is safer feeding than grass cut in low lands below the surface. The soil of Bellary is impregnated with salines, among which is chloride of sodium or common salt, and this possibly renders it an unsuitable habitat for the development of bacilli.

5th.—The water in most wells is brackish, and salt is found generally in the dry beds of tanks.

6th.—The general health of the horses at this station points to some geological or meteorological (possibly both) condition in their favour. Hosúr and Bangalore are (with respect to climate, soil, prevalence of disease among animals in surrounding villages) identical as regards conditions for the spread of the disease; but the surroundings of the Remount depôt are cleaner, little or no trade, more open, horses not so numerous and crowded, a better supply of grass, and the water unimpeachable. These are the only differences which can possibly account for the fewer cases at the Remount depôt at Hosúr.

C.—SANITARY AND PROPHYLACTIC.

At Bangalore we have four conditions of horse lines: 1st, stables for British cavalry with ample superficial and cubic space; 2nd, a battery of horse artillery in crowded lines; 3rd, a battery of field artillery with enormous superficial area; and 4th, a regiment of native cavalry with unlimited superficial space on ground not previously occupied.

We find that under these different conditions Anthrax has appeared in one and all, and it would seem that we have nothing here to draw conclusions

from. We notice that the two field batteries and Lancer lines are contiguous, and closed in on one side by the barracks, and on the other by the horse-keepers' parcherry; these lines are not only too crowded, but too much closed in. The Horse Infirmary common to the field batteries, as shown in Local Investigation Report, is situated close to the public road and open to trespass of cattle, goats, sheep, etc. A four-feet mud wall would remedy this evil. This remark applies generally to all open lines.

2. STABLE FLOORING.—The stable and picket floorings throughout the cantonment of Bangalore are faulty in construction and in material, the latter especially so.

We have noticed under "B" the superiority of the floorings at Hosúr, which we would recommend being adopted throughout the service where the horses are stabled, but for exposed pickets we do not think (owing to the amount of clay used in construction) that it would answer; but if the object aimed at, viz., prevention of percolation of fluids, is to be overcome, we can only recommend the more costly mode of cemented concrete. We notice that at Bellary there is a second set of pickets, one for dry, the other for wet weather. This we think an excellent idea, and is perhaps capable of still further improvement if a complete double set of lines could be established in all regiments and batteries, one of which could be occupied alternately in wet and dry weather. The reason for this is obvious.

3. We find in Madras S.G.O., No. 115, of 13th December, 1883, page 274, para. 3, the recommendation of the addition of lime to the material for stable flooring. We have already shown that lime is a necessary chemical constituent for the growth of *bacillus anthracis*. Its use as a disinfectant is also recommended in the same S.G.O. Experiment has proved that a portion of Anthrax tissue exposed to the action of quicklime for several hours, still possesses the power of producing the disease on inoculation.

Para. 30 of the above S.G.O. directs the removal of tainted picket earth to without cantonment limit; this would form another focus of infection, and we would suggest that the surface soil of pickets should be purified with fire before removal.

4. MANURE, DISPOSAL OF.—The arrangement for this is most defective. The contractors who purchase the manure are capricious in removing it; much depends on the season of the year, the use he has for his bullocks, and the state of the roads. As a sanitary measure, we recommend the introduction of paved and covered manure receptacles, similar to those in use in the Silladar horse lines. No accumulation of manure should be permitted. Should there be unavoidable delay in emptying them on account of rain or for other reason, there would be no fermentation or saturation of the surrounding soil.

5. WATER.—As before noticed, the water-supply of Bangalore is from the Ulsoor tank, and the remarks already made under heading "Water" will show that it is not above suspicion. We can only recommend the strictest conservancy of the tank, rigid exclusion of cattle, and prohibition of direct water lifting in chatties for domestic uses. The construction of walls at convenient intervals round the tank would probably obviate the latter contamination. The water-trough of the field battery sick lines and that of M Battery, 2nd Brigade, Royal Artillery, are dangerously close to a public road, and open to pollution as shown in the Local Investigation Report. Both of these should be enclosed or removed to a place where they can be guarded against pollution.

With reference to the water-supply for the native cavalry, already noticed under its proper heading, we recommend that either Ulsoor water should be laid on or a well sunk for the use of the regiment.

6. GRASS.—Roughly estimated, there are, including civil, military, trans-

port mules, etc., about 4 000 horses at Bangalore, and it cannot be wondered that the quantity and quality of grass is so difficult to supply, and this particularly the case during the dry months of the year. The fact of the grass-cutters in this army being women increases the difficulty, for they are under no control. We have already pointed out the possibility of grass being cut in infected places, and this under the present system is impossible to obviate. The present method of grass supply is so radically bad that we fail to see a way of suggesting any improvement, except that of setting apart certain lands sufficiently near to Bangalore to admit of daily coming and going with a head bundle; this, we understand, is out of the question, owing to the high value of land in the vicinity of the station, and we need not point out that the acquisition of a large tract of land in foreign territory would offer some difficulty in obtaining.

7. HAY SUPPLY.—The climate of Mysore, for the most part, and particularly that near Bangalore, is favourable on account of its well-distributed rainfall for the growth of hay, and it has for many years past been an industry in the compounds of cantonment; its cultivation as a special industry has been carried on at Ooscotta—a town about eighteen miles from Bangalore. From information we obtained from the Deputy Commissioner, Captain Macintire, we understand that the cultivation of hay is capable of still greater extension, and, if sufficient notice could be given, he thinks the cultivation would be taken up and a supply created sufficient for all Government demand. While recommending the desirability of encouraging the growth of hay and its use in lieu of grass, we do not wish it to be understood that it would afford complete immunity against Anthrax; for, as we have already shown, hay itself may be a source of infection, though *undoubtedly* not to the same extent as grass-cutters' grass.

8. RUMNA GRASS.—Rumna does not exist in Mysore, and the natural or wild grasses do not grow here as in the more northern stations of the Presidency. Moreover, formation of rumnas offers the same difficulties as that already pointed out in the case of lands proposed to be set aside for grass-cutters.

9. SALT.—We have already noticed the possibility of salt acting in some way as a prophylactic against Anthrax when dealing with section "*B*." It is not improbable that salt may in some way render the blood an unsuitable medium for the growth of *bacillus anthracis*, and we consider that an increased daily ration of salt should be given to the horses at Bangalore, with the view to test whether it really possesses this prophylactic property. The experiment would be a very inexpensive one, and might prove of great value. We are much struck with a statement made by the Government Cattle Inspector, Mr. Mills, who says that since the prohibition of Government against the manufacture of earth salt in the Kurnool district, cattle disease, which had hitherto been rare there, is as common now as in other districts.

10. INOCULATION.—Regarding inoculation as a preventive against Anthrax, we have little to say and nothing to recommend.

The subject of inoculation is still under experiment, and nothing has yet been definitely settled. Great care is required in the preparation of the so-called "vaccine," and it is not shown that this can be satisfactorily performed by any one but M. Pasteur, who keeps a chief portion of its process a secret.

Experiments have been made with "vaccine," and instead of immunity, Anthrax has frequently been produced. Again, it has not yet been demonstrated how long immunity will last; it is probably for only a short time.

We do not feel justified, in the face of so much negative evidence and the limited knowledge of the subject, in recommending to the notice of Government "vaccination" as a *preventive measure.*

CONCLUSIONS.

11. Our conclusions from this inquiry are—

1st.—Anthrax occurs in Bangalore amongst Government horses under all conditions of age, sex, breed, and stable management.

2nd.—We have shown that the infection may be conveyed either by the air, food, or water from infected spots.

3rd.—The primary sources of infection may be carcasses or excreta of diseased animals. We have also pointed out that the disease may, under suitable conditions, arise spontaneously (*vide* paras. 41-45, "Hay"). Accumulations of organic matter, offal, etc., are shown to be most favourable to the development of *bacillus anthracis*.

4th.—With the object of reducing the number of sources of infection to a minimum and to avoid the causes of infection as far as possible, we recommend stricter attention to cantonment sanitation, and have made recommendations on certain points, which we here reiterate—

(*a*) Disposal of manure.
(*b*) Cleanliness of lines surroundings.
(*c*) Prevention of intrusion of cattle, etc.
(*d*) Professional supervision over slaughter cattle at all the slaughter-houses in and out of cantonment.
(*e*) Disposal of offal from slaughter-houses.
(*f*) The cremation of carcasses of Government horses which die from contagious disease (already provided for in the S.G.O. previously quoted), and we would strongly urge the necessity for similarly disposing of private horses and cattle which die of Anthrax, which, if left exposed, would prove fresh centres of infection.
(*g*) Wells provided for civil population, instead of present system of pollution of Ulsoor tank.
(*h*) More perfect attention to the watering-troughs, and construction of a well for 1st Light Cavalry lines.
(*i*) The disestablishment of grass-cutters in whole or part, and formation of grass or hay lands.
(*j*) The formation of double sets of lines.
(*k*) Improvement in method of stable flooring.
(*l*) An increase in the daily ration of salt.

12. The Committee do not feel themselves justified in going beyond the above recommendations in their present state of knowledge of the subject.

We are now "in the dawn of a new era," and in the words of Dr. Cornish, Surgeon-General, Indian Medical Department, in his address before the South Indian Branch of the British Medical Association, he says, when referring to the labours of those eminent scientists, Dr. Koch and his colleagues, who are now in India investigating the subject of Cholera—"an era in which things that we see and know but dimly will stand forth in broad and dazzling light"—Cholera, Anthrax, and other zymotic diseases are so intimately connected one with the other, and the revelations expected are so important, that we feel it would be presumption to go beyond what we have recorded.

The Committee, while feeling their powerlessness to grapple with so insidious a disease, or to suggest any positive preventive beyond increased sanitation, are satisfied that they have duly weighed both sides of the question, and, if nothing else, they have collected a mass of facts which will be useful for further investigation.

(Signed) W. PAYN, *Lieutenant-General President.*
(„) F. G. SHAW, *Inspecting Veterinary Surgeon.*
(„) W. S. ADAMS, *Veterinary Surgeon, 1st Class.*
(„) J. MILLS, *Veterinary Surgeon and Inspector of Cattle Diseases.*
(„) F. SMITH, *Veterinary Surgeon.*

Members.

Review.

A Text-book of Operative Veterinary Surgery. By George Fleming, LL.D., F.R.C.V.S., Principal Veterinary Surgeon to the Army. (London: Balliere, Tindall, and Cox. 1884.)

This work, when finished, will supply a want which has always existed amongst the English-speaking members of the veterinary profession in every part of the world. The books upon veterinary surgery hitherto published explain the methods of performing some of the most important operations, but frequently in such a way as to be of little use to men who have not already had considerable experience. In the work now under review nothing is omitted; even the youngest practitioner will find his every need met, and the descriptions sometimes almost unnecessarily minute in their details.

The opening chapters contain a full account of the blinds, twitches, hobbles, and other apparatus employed in various countries for securing animals, and the best ways of using them. Numerous engravings are given, which materially assist the reader in comprehending the text. Among these is an illustration showing a peculiar method of casting the ox by means of a rope looped round the neck and body. It is called "Rueffs' method," but it was in ordinary use amongst the natives of Bengal many years ago, the only difference being that, to the best of my recollection, the neck was left free. It is difficult to understand why the act of tightening two loops, one round the chest and the other round the loins and flanks, should force an ox to lie down; but certain it is that the animal drops as soon as the two ends of the rope are pulled.

Some pages are devoted to a discussion upon the causes of the occasional fracture of vertebræ when horses are cast, and the best means of avoiding such a misfortune.

There is a whole chapter upon the administration of anæsthetics, containing recipes for compounding the most useful kinds, and some excellent practical remarks upon the employment of chloroform, by Mr. Roalfe Cox, a veterinary surgeon in the West of London. He has performed all operations upon animals under the influence of that agent for more than twenty years, and out of hundreds of cases has never seen a horse injuriously affected by it.

The various instruments required in performing operations are described, and illustrations are given showing the proper ways of holding them when in use.

In the remainder of the first part of the book the most important subjects are the prevention and arrest of hæmorrhage, the various methods of closing wounds, and of applying bandages to all portions of the head, body, and limbs.

In the commencement of the second part, twenty-five pages are filled with a description of dislocations and fractures, and their treatment; following which are chapters upon the removal of tumours, upon cauterization, setons, hypodermic and other injections; operations on blood-vessels, muscles, tendons, ligaments, and nerves, amputations, extraction of bullets and other foreign bodies from wounds, and trephining.

The book contains no less than 295 engravings, which greatly assist in elucidating the printed descriptions.

Many good practitioners, a few years after leaving the veterinary colleges, are liable to find their anatomical knowledge of certain parts somewhat hazy when called upon to perform unusual operations. In such cases a reference to this work will greatly diminish the risk of mistakes, which might possibly cause pecuniary loss to the owner of a valuable animal, and extreme mortification to the feelings of the operator. But it is no exaggeration to say that the most experienced and skilful veterinary surgeons cannot fail to profit by a careful perusal of the book. The author evidently intends it to be a complete guide to the performance of every operation which can well be required in the treatment of any of the domesticated animals. The very moderate price (half-a-guinea) at which it is issued by Messrs. Baillière, Tindall and Cox, places it within the reach of all, and it is to be hoped that the second volume will not be long in making its appearance.

J. J. Meyrick, F.R.C.V.S.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, HELD JULY 29TH, 1884.

Professor Walley, President, in the chair.

The following members of Council were present: Gen. Sir F. Fitzwygram, Bart., M.P.; Dr. Fleming; Professors Robertson, Williams, McCall; Messrs. E. C. Dray, Henry Simpson, F. W. Wragg, J. Harpley, William Whittle, William Woods, H. J. Cartwright, T. Greaves, P. Taylor, F. Simcocks, B. Cartledge, J. D. Barford, W. Duguid, J. Cox, and the Secretary.

The President said, before the business of the meeting commenced, he wished to thank the Council for the kind manner in which they had elected him to the office of President. He must confess that when last he was in the Council-room he had not the slightest idea that such an honour would be conferred upon him; while he had further to acknowledge that when twenty-

two years since he was a candidate for the diploma of the College he little thought that he would occupy the position which he was so proud to fill that day. There were a few things always looked for in the President of a Council of this kind. The first was that he should have plenty of time at his disposal, the second that he should have plenty of money at his disposal, and the third that he should be both willing and anxious to devote all his energies to the good of the College. He confessed that he could not fulfil the two first conditions, but he thought they would give him credit at least for being anxious to carry out the third condition, and he hoped that at the end of his period of office none of them would be able to say he had neglected any duty necessary for him to perform. Certainly his means of attendance might not be so great as he could wish, and perhaps being a little fresh to the office he might not be able to carry on his duties at first quite as smoothly as could be desired, but with the good help of the Council and the good help of those who had preceded him as occupants of the chair, he trusted that the Council would not have to repent the choice they had made.

The business of the meeting was then opened by

The SECRETARY reading the notice convening the meeting.

The minutes of the previous meeting were read and confirmed.

Absentees.

The SECRETARY read letters of regret at absence from Messrs. Santy, Walters, Perrins, Blakeway, and Reynolds.

Presentation to the Council.

The SECRETARY announced that a presentation had been made by Mr. Charles Percival, A.V.D., of some plates which had been his father's.

On the motion of MR. DRAY, seconded by MR. CARTLEDGE, a vote of thanks was passed to the donor.

Correspondence.

The SECRETARY read a letter from an unsuccessful student. It was ordered by the Council that the letter be acknowledged and laid upon the table.

Report of the Court of Examiners.

The SECRETARY having read the report,

The PRESIDENT pointed out that several of the students had been put down as having passed with "credit." He was not aware of any such honour, the marks being confined to "great credit" and "very great credit."

The SECRETARY explained that the examiners had used the term, because though the student in question had not passed sufficiently well to have "great credit" placed against him, he had yet shown greater ability than that required merely to pass the examination.

Mr. WHITTLE moved that the word "credit" be expunged.

Mr. WOOD seconded it, and the motion was carried, as was also a motion for the adoption of the report.

Fellowship Degree.

The SECRETARY read the names of the successful gentlemen in this examination.

The list was accepted and adopted by the Council.

Finance Committee.

The SECRETARY having read the report of this Committee,

Mr. DRAY drew attention to the extra charge for the use of the room in which the annual dinner had been held. He had also to complain, as last year, of the charge of ten guineas for vocalists, and of £5 for dinner tickets for vocalists. There was also a charge of 7s. 6d. for refreshments supplied to musicians. He thought the College funds should not be used for payments such as these, but that charges of this character should be borne by those who attended the dinner. He begged to move the following resolution: "That no expenses incurred at the annual dinner be defrayed from the funds of the Royal College of Veterinary Surgeons in future."

Mr. WHITTLE seconded the motion, which was supported by Professor Williams.

The PRESIDENT having remarked that he was entirely in accord with Mr. Dray's motion,

Mr. CARTLEDGE moved as an amendment, that the words "without the consent of the Council" be added to the resolution. It would be unwise to adopt any hard and fast rule. He remembered that when Mr. Mundella and several other officials of the Privy Council attended their dinner it was thought to be an act of politeness to make the proceedings as enjoyable as possible, and should they have any distinguished visitors on any future occasion they would be restricted by the resolution, if passed from incurring any expense which would be necessary in order to make the proceedings satisfactory in their nature.

Mr. WHITTLE thought a hard and fast rule was required. If there was any necessity for variation in the usual programme let the Council bear the expense amongst themselves, but by no means would he have the funds of the College taxed in the way they had been in connection with the dinner.

Professor MCCALL seconded Mr. Cartledge's amendment.

The original motion having been put and lost, the resolution as amended was carried.

The necessary cheques were ordered to be signed for the current liabilities.

The report of the Finance Committee was then adopted.

House Committee.

The SECRETARY read the report of this Committee, in which they recommended to the Council that the Secretary be empowered to make an offer in the terms as proposed in the letter from Mr. Beeston, the estate surveyor.

The PRESIDENT said that in the matter of the proposed new buildings there had been laid before the Committee a proposition in reference to a house in Bloomsbury Square. £4,500 had been asked for it on a seventy-four years' lease, and, in order to provide a room fit for the Council meetings, extensive alterations would have to be carried out, and that having been done, there would be a large portion of the house entirely useless as far as convenience for the Council was concerned. Under these circumstances the Committee had not felt themselves warranted in taking any further action in connection with these premises. Subsequently the architect and surveyor of the house in which they were then meeting was spoken to as to putting into the hands of the College the site of the present building, so that the new premises might be erected thereon. The architect said that the present site could, he thought, be had on a sixty-three years' lease at a ground rent of £64 per annum; that it would cost the College to build such premises as they required for the accommodation of the Council about £2,000; and that a house for the Secretary, if provided for, would necessitate over an additional £2,000

expense. The option might be given to the Council during the first three years to purchase the freehold. If that could be done, he (the President) thought it would be far better than taking a building on a lease of sixty-three years. There was a little bit of sentiment no doubt in connection with the wish to remain at the old place, but if anything more advantageous could be obtained, of course a matter of feeling could not be allowed to stand in the way. He thought, however, it was time that something definite should be done.

Mr. GREAVES thought it was decidedly the best plan to have a new building erected on the present site, which would answer the necessities of the Council and be a credit to the profession.

Professor WILLIAMS proposed that the matter be left in the hands of the Committee.

Mr. SIMCOCKS asked if it was understood that they were to purchase the freehold?

Professor WILLIAMS.—Most decidedly.

Mr. GREAVES said if the freehold was purchased and premises erected, it would be an investment for future generations, whereas, if the house in Bloomsbury Square was taken, the expenditure of £4,500 upon it would be gone for ever.

The PRESIDENT moved the election of Mr. Dray as a member of the House Committee, on the ground that he was one of the oldest members on the Board, and also because he held the important office of Treasurer and was located in London.

Mr. WOODS seconded the motion, which was agreed to.

Mr. SIMPSON, as a member of the House Committee, was not prepared to go the length of agreeing to accepting the present site on leasehold if the freehold could not be purchased.

The PRESIDENT remarked that the district surveyor had pronounced the existing building as unfit for habitation, and as positively unsafe, so that something must be done without delay.

Mr. SIMPSON said if the premises were pulled down another place would have to be found in which the Council might meet; and he would venture to suggest that the Society of Arts' room should be engaged. At any rate, it was better not to rush into unnecessary outlay, and take the site on a leasehold.

Mr. COX questioned whether the Committee as a House Committee could be entrusted with matters which ought to be considered by a Building Committee.

The PRESIDENT suggested that the Committee should be entitled the House and Building Committee, and moved a resolution to that effect, which was seconded by Mr. DRAY, and agreed to.

Mr. HARPLEY moved that the name of Sir Frederick Fitzwygram be added to the Committee.

Mr. DRAY seconded the motion, which was carried.

The PRESIDENT said there was next to be considered the house for the Secretary.

The SECRETARY said that the present house, as already reported to the Council, was really not fit for habitation. The domestic arrangements were imperfect, while the place was deluged whenever a shower of rain occurred.

The matter was ultimately left to the Committee to be considered at an early future meeting, with powers to act.

Registration Committee.

The SECRETARY read the report of the above Committee, together with their recommendations in cases of complaints, both from members of the College

and from registered practitioners, with regard to persons practising contrary to the Act. The Committee having carefully considered each case of complaint, recommend that the Secretary be authorised to send a cautionary to the offending persons, and that with regard to the more serious charges of complaint, particularly in respect to those who transgress under Clause 16 of the Act, the consulting solicitor to the College should be consulted. It was also recommended that in cases where solicitors had applied to conduct the prosecution for their clients under Clause 19 of the Act, the Council should allow them to do so, of course at their own cost. The Committee, in addition, recommended the appointment of Mr. George Thatcher, of Doctors' Commons, as solicitor to the College, and that in case counsel be required, Mr. Morton Smith, barrister-at-law, be consulted.

Professor WILLIAMS asked if there was not already a solicitor appointed.

Mr. HARPLEY thought Mr. Wilkinson was the solicitor.

Dr. FLEMING said he was under the impression that Mr. Wilkinson was not, nor had he for many years acted for the College, and gave reasons why that gentleman was not employed.

The PRESIDENT suggested that, in order to remove any doubt, it would be necessary for some one to propose that Mr. Wilkinson's appointment be cancelled.

Mr. DRAY moved a resolution in accordance with the suggestion, which was seconded by Mr. WRAGG and agreed to.

Mr. SIMCOCKS thought it would be necessary to employ an attorney conversant with criminal practice.

The SECRETARY said the gentleman proposed (Mr. Thatcher) was well acquainted with the working of the Act.

On the motion of Mr. DRAY, seconded by Mr. WRAGG, the report of the Registration Committee was adopted.

Appointment of Examiner in Chemistry for the London Board.

Professor ROBERTSON proposed Mr. Heaton (who he said was Lecturer on Chemistry to the Charing Cross Hospital, and author of one of our popular text-books) for the office, remarking that the College ought to have as high an authority as possible upon the scientific subject of chemistry.

Professor WILLIAMS seconded the proposition.

Mr. GREAVES proposed that Mr. Stevens, a member of the College and a pharmaceutical chemist, be elected, holding that the College should have its work done by members of the profession. He thought if that practice were adopted young men would be encouraged to become fit for Examiners, and if such offices were withheld from them it would be a serious loss to the profession.

Mr. DRAY seconded the motion.

Mr. SIMPSON thought it was a great honour to have men eminent in chemical science connected with the College as Examiners, and for that reason he thought Mr. Heaton was to be preferred.

A ballot was then taken, with the result that Mr. Heaton was elected.

Date of next Quarterly Meeting.

In answer to a question by Mr. WHITTLE on this subject,

The PRESIDENT said he would endeavour, if it was possible, to arrange that the meeting should take place on Thursday, the 2nd of October next.

The Royal Agricultural Society and Veterinary Surgeons.

Mr. SIMPSON moved: "That a committee be appointed to place itself in communication with the Council of the Royal Agricultural Society in refer-

ence to the proposal of the said Council to appoint a consulting veterinary surgeon for the whole of each county, and assign to such veterinary surgeons certain privileges relating to the sale of medicines and drugs throughout the districts for which they are appointed."

He drew attention to a pamphlet, "On the Domestic Veterinary Treatment of the Animals of the Farm," by Professor G. T. Brown, which he stated had originally appeared as a paper in the *Journal of the Royal Agricultural Society*, but had since been published separately, price sixpence. It had been arranged by the Royal Agricultural Society that Professor Brown should draw up a list of names of the veterinary surgeons to be appointed, for the consideration of a Council of the Royal Agricultural Society.

Now, his (Mr. Simpson's) fear was, the Society was going to do something which would press very hardly upon members of the profession.

He believed the country was supplied with veterinary surgeons well able to attend to the agricultural community, and that to select one man in each county as the recognised authority on veterinary matters would be detrimental to the interests of the other practitioners, though this should not weigh if a necessity actually existed.

The selected veterinary surgeons were, moreover, to be asked to supply in their county the medicines recommended by Professor Brown in the pamphlet, and thus, instead of local veterinary surgeons as heretofore supplying their clients with medicines, there was the fear that the appointed veterinary surgeon would become retailer of medicines for all his county if he was what is called a pushing man. With regard to the pamphlet, he (Mr. Simpson) recommended every member of the profession to buy one, the tenor of it was —use the remedies and put off sending for a veterinary surgeon as long as possible.

He feared a very considerable portion of a rural veterinary surgeon's income was doomed, as the reader of the pamphlet would now go for his medicines either to the veterinary surgeon for the county or to the druggist. And already in an influential sporting paper he had seen an advertisement of the remedies recommended by Professor Brown in his pamphlet on sale by a firm of druggists.

He knew the Royal Agricultural Society was actuated by the best feeling towards the veterinary profession, but he believed the whole thing was a mistake, and if a representation was made to the Society by this Council he believed benefit would result.

The PRESIDENT thought that it would do a great deal of harm to the profession to put the stamp of a man of so high a position as Professor Brown upon a system which seemed to go in the direction of converting veterinary surgeons into mere dispensers. The most objectionable thing about the proposal was that it implied that a veterinary surgeon, in his own district, was not capable of supplying drugs in such cases as those referred to by Professor Brown. He (the President) knew what it was himself to contend with the men who flooded the country with their cattle medicines, and very often the cream of the profit of the district was taken from the veterinary surgeons. Unfortunately, the proposal of the Society was just on the lines of the procedure of such men, putting into the hands of people medicines prepared by chemists and druggists. It was the place of the Council to take into consideration all circumstances affecting the welfare of the profession, and if it was thought that the proposed committee to meet with Professor Brown and the Agricultural Society would be of service to the profession in this matter, it would be its duty to give consent.

Professor WILLIAMS seconded the motion.

Mr. SIMCOCKS thought it hardly worth while that the College should go hat in hand to the Agricultural Society, because the mischief had been done

already by the publication and circulation of the pamphlet. He considered the Society had acted within their right, because it was their province to guard the interest of the farmers.

Mr. SIMPSON said it would hardly be right to do so if it involved a wrong to veterinary surgeons.

The motion was then put and carried, the following being the gentlemen nominated to form the Committee: The President, Mr. Cartwright, Mr. Wragg, Mr. Dray, Mr. Simpson, Mr. Greaves, and Mr. Cox.

Matriculation Examination.

The PRESIDENT said that the Royal College of Preceptors had been appointed to carry out this examination, but, inasmuch as that body did not exist in Scotland, there had been a difficulty in complying with the bye-law in the matter. He therefore moved: "That in Scotland the Educational Institute be accepted as the examining body in lieu of the College of Preceptors."

Mr. SIMCOCKS seconded the motion, which was agreed to.

Obituary.

The SECRETARY read the names of members of the profession recently deceased, amongst them that of Mr. Cowie, of Dulwich Common.

The PRESIDENT said that Mr. Cowie had been for a long time a member of the Examining Board, and was well known and respected in the profession. The least the Council could do would be to instruct the Secretary to forward a letter of condolence to Mrs. Cowie in her bereavement.

This suggestion was unanimously adopted by the Council.

Notices of Motion.

The following notices of motion were given:—

Professor MCCALL to move: "That at the C or final examination the number of individual Examiners be such as is indicated by Bye-law No. 7, relating to examinations. That is to say, that two separate and distinct individual Examiners conduct each department or section of that examination, or that four additional Examiners for the C examination be appointed."

Professor WILLIAMS to move: "That at the C or final examination, the oral precede the practical; that if the student pass the oral, he shall be allowed to present himself for the practical at the same meeting of the Board, and if successful obtain his diploma; but if he fail at the practical examination he shall only be compelled to present himself for examination in the practical, and at such a time as the Board may determine; the student thereafter to have the privilege of obtaining the required practical knowledge, either at his college, or to furnish evidence that he has in the interim been under the tuition of a qualified member of the Royal College of Veterinary Surgeons."

Mr. SIMCOCKS to move: "That at the final or C examination a written examination be added to the oral and practical."

The PRESIDENT to move: "That the salary of the Secretary for the Scottish section of the Board of Examiners be increased."

On the motion of Mr. DRAY, seconded by Mr. GREAVES, a vote of thanks to the President was unanimously passed, the proceedings terminating with the acknowledgment of the compliment by Professor Walley.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

THE summer quarterly meeting was held at the Queen's Hotel, Leeds, on Wednesday, 23rd July, the President, Mr. Parlane Walker, in the chair.

The following members were also present, viz. :—Messrs. M. E. Naylor, T. Greaves, Jos. Carter, J. W. Anderton, J. M. Axe, Peter Walker, B. Smith, T. C. Toop, W. F. Greenhalgh, G. Whitehead, A. W. Briggs, Bell, Pickering, P. Carter, J. H. Ferguson, and the Secretary. Messrs. McCormick, Pollard, H. J. Axe, and T. E. W. Lewis were present as visitors.

Messrs. Dray, Bale, Danby, H. Carter, G. Carter, Jas. Freeman, Jos. Freeman, sent excuses for non-attendance.

The minutes of the previous meeting were read and confirmed.

The SECRETARY read a letter from the Hon. Sec. of the Western Counties Association, desiring mutual co-operation in supporting the election of members of council. A letter was read from Mr. Jas. Freeman, acknowledging the sympathy of the members in his long affliction.

Mr. ANDERTON nominated Mr. Herbert Pollard, Wakefield ; Mr. NAYLOR proposed, and Mr. ANDERTON seconded the proposition, that a letter of condolence from the members of this society be forwarded to Mrs. Fallding and family, expressing sympathy with them in their affliction.

The SECRETARY and Mr. GREAVES made a few remarks, exhorting the members to attend the meeting of the National Veterinary Medical Association at Manchester the week following.

Mr. GREAVES read his paper on "The Nature and Prevention of Glanders," expressing the opinion that in all cases this disease is caused by the presence of micro-organisms in the blood. He considered that although the symptoms of the disease varied, the presence of ulceration of the Schneiderian membrane and Farcy buds are characteristic of the malady.

Mr. NAYLOR said the disease might remain in a horse undetected for an almost indefinite period, and continue to be the medium of contagion. He thought the adherent state of the gland to the inf. maxillary bone a certain symptom of Glanders. He considered that where bad ventilation existed in stables Glanders would invariably exist, and related a singular case of glanderous matter being thrown upon the eyelid of a man, thereby producing the terrible malady.

Mr. PETER WALKER said, in the absence of some of the diagnostic symptoms, he had noticed occasional discharge of blood per nostril, the ulcers being situated high up the Schneiderian membrane.

The discussion was continued by Mr. JOS. CARTER, the SECRETARY, and Mr. P. CARTER, who argued that Glanders may be produced by bad ventilation, or through septic poisoning. They agreed that the symptoms varied, and required strict watching.

Mr. TOOP said in nearly all cases of Glanders the lungs are primarily affected. The disease being a blood affection, tubercle of the lungs may exist long before any of the external diagnostic symptoms appear. He said that Pasteur and Koch had succeeded in isolating the virus or micro-organisms of Glanders.

Mr. NAYLOR proposed, and Mr. BRIGGS seconded, a vote of thanks to Mr. Greaves for his kindness in introducing the subject for discussion. (Carried unanimously.)

The PRESIDENT read a paper on

Overstocking in Cows.

VICE-PRESIDENTS AND GENTLEMEN, The subject of my paper is overstocking of milk in cattle. I don't intend it to be a long paper, but one directed rather to the elucidation of this, that has hitherto from various causes been a subject which has, so far as I have been able to gather, never engaged that attention it has deserved at the hands of our profession.

My study of the matter has been drawn to it by a case of alleged torture to a heifer, that was brought before a local bench, and conviction obtained a few days ago. Members of our profession, from Principals downwards, were subpœnaed *pro* and *con*, and in my humble opinion it was astonishing what an absence of definite ideas or conviction was shown. We seem to be in about the same state of knowledge on the subject that our forefathers were in before the Flood, and from some cause, either of insufficient information or from a too ready disposition to take for granted that cruelty *must* exist, erroneous statements, I believe, are made the means of opinions being propagated which a closer study of the subject might prevent; or it might be that some of nature's laws are too simple for our notice. We have no time to enter at length into the physiological and anatomical aspect of the question, and I shall only touch them incidentally to enforce any practical deduction drawn from consideration of the matter. What does nature say to us in all its ramifications but this; is it consistent with the beneficence of an all-wise Creator that myriads of mammalia which, from accident or design, lose their offspring in the full flow of milk, should have no means of painlessly relieving their overcharged glands? As a matter of fact and notoriety you can call to mind observations and experiences promiscuously received, which will, no doubt, whilst I am speaking, convince you that nature does her work in a far grander way than to leave the poor creatures in a helpless state of torture. Have you not all seen the milk flow from domesticated animals under the circumstances described, producing a healthy condition? what more natural? Go a step further; most of you, no doubt, will be able to bear testimony to the painless operation of nature in the human subject. I know that I may be met by the remark that the cow has been developed into a milking machine; granted, but if nature is susceptible of development in one direction, can it not be accepted that a protecting capacity is also bestowed?

We shall look for a moment at the physiological change that takes place in the udder previous to parturition. The period of its development is much longer in the heifer than in the cow: in the heifer six or eight weeks from calving the udder begins to enlarge by the action of a greatly increased quantity of blood, which may be termed Hyperæmia, healthy congestion, or Honed. This determination of blood steadily increases, and acquires its highest state of development at parturition, not only in the gland, but in the surrounding tissue, sometimes reaching the whole extent of the perineal region, and a considerable length along the course of the linea alba, which produces a feeling of tenderness and distention, a very valuable sign. This swelling subsides gradually about ten days after calving; then the udder is in working order, and the animal in full flow of milk. We know that all this extensive swelling is there for the purpose of developing and preparing the gland (especially the milk-secreting cells) for active duty. The gland previous to parturition secretes a milky aqueous fluid, which no doubt plays an important part in putting and keeping the cells in tune, and to me it seems bad practice to draw it from the cow continually for six or ten days previous to calving.

The milk first secreted after parturition known as colostrum (or beastling) is very different from ordinary milk, and possesses a strongly purgative action,

which is useful in clearing the bowels of the calf. I may say that I believe that this secretion has also an important function to discharge in the gland itself, and I question if it is wisdom to drain it all immediately after calving; one fact we do know, nature does not do so.

As to the anatomy of the part, suffice it to say that, as we are aware, there is a round or sphincter muscle in the teat, for the purpose of preventing the milk flowing when the gland is not full; this very thin muscle is blended with yellow elastic tissue. Sucking, pressure of the hand, and distention, have all the power of opening it. At the centre of each quarter, just at the base of the teat, is a large sinus, the general receptacle of all the lactiferous conduits, and from this sinus, which is sometimes large enough to contain a quart, proceeds down the centre of the teat a definite excretory canal.

Now that we have got the cow in the full flow of milk, and that milking is neglected at the proper time, what is the result? The milk flows from the gland, and the cell secretion is partially arrested, *Why?* I reply, the fact of the reservoirs and ducts being charged with milk induces the secreting cells to retire partially to rest, and also diminishes the flow of blood for the time being, and, if allowed to stand for a few days, will in all probability produce temporary atrophy of the cells. Hence, the result of overstocking would be driving away the milk; the same thing will occur through the udder not being drained dry when milked. The secreting cells are in their greatest activity when the glands are empty. Some may say, What about the hard or stiff milkers? It is generally acknowledged that the stiff milkers are caused by white inelastic tissue blending with the delicate sphincter muscle. It may be so, but have you ever asked yourselves if this muscle is voluntary or involuntary, for I have long believed that the muscle or the structure of the gland itself is under the power of the will? How often do we find cows that will let down their milk to one person, and not to another; in fact, how often do we find cows that will not let it down at all until they get something to eat to draw their attention from the operation. This fact is most apparent at the period of æstrum, when you can draw the teats from fifteen to thirty minutes without getting a drop, but when the cow has changed her mind it will come freely, and you have a good milking. How often do we find good, free milkers made stiff milkers through abuse. I maintain the temper of the cow has much to do with it, and that may be developed by the free use of the buffet, stool, or some more convenient instrument of torture. We know that a free milker can be made otherwise by a bad-tempered milkmaid, and that a good-tempered milkmaid can generally milk any cow. The milk, when left in the udder, changes in its consistency: when drawn about the third day, sometimes it is thicker than usual, and at others it has a bluish watery appearance. There is no froth on its top, and it has a very saline taste, which is a clear proof to my mind that disorganisation has taken place preparatory to the absorbents taking it back into the system in its simple elements. From the appearance and size of the udder, you would expect four or six quarts, but will have to be satisfied with two or three gills; thus it is perfectly patent that the distention of the udder at this period is not altogether due to the milk it contains. I hold that cows can be put dry at any period of lactation, without pain or torture, and there can be no doubt but that nature's system of drying them is the best. The milk standing in the gland, I believe, has two important functions to perform, one previously mentioned, inducing the cells to rest, and the other rousing the absorbents to action; this state is attended with distention or healthy congestion, not to the same extent, but very similar to the cow preparing to calve. The same law holds good in the other domesticated animals. I have seen it in the cow, the bitch, cat, and sow. If it is torture to the cow it is much more so to the other animals named, inasmuch as they have a larger secretion

in proportion, and if a distended udder in the cow subsequent to calving is torture, may we not deem it a logical inference that the same torture exists under similar conditions before calving? Who is there amongst us that would advance such a proposition?

It is a universal practice in the spring, and at this season of the year, to turn out cows to grass giving from one to three quarts of milk, for the purpose of bringing them up in the back, and as back calvers. Some owners practise drawing the milk from time to time, others will go about the sixth day and milk them dry; others, again, leave them to go dry of themselves, and this, in my opinion, is the most natural and common-sense mode of practice, inasmuch as the more you draw them the longer they will be going dry. What does the owner find when he goes on the sixth day? The udder is distended from hyperæmia, healthy congestion, or honed; also in the perineal region and to some extent along the course of the *linea alba* he finds swelling, which is a determination of blood to the part for the express purpose of feeding and stimulating the absorbents while in action, whose office is to absorb the disorganised milk and carry it through the lymphatics into the thoracic duct.

Now, gentlemen, we come to the most important and vital part of my paper, How does the milk leave the udder? This is a question that the medical, as well as our own profession, has overlooked, a question most essential to the interest of the whole animal economy, and until we thoroughly understand it we are not in a position to give evidence in a justifiable manner. We shall look, not with a theoretical lens, but with a common-sense practical microscope, at nature's plan of drying the udder. One of the functions of the gland is to secrete milk, and there can be no two opinions but that the gland has also the power of disorganising the milk, and breaking it up into its simple elements; an operation attended with as little tenderness or uncomfortable feeling as the other. The extent of this distention, which produces a feeling of tenderness (another valuable sign), depends upon the quantity of the milk in the gland, and generally about the tenth day the swelling will have subsided and all will be well, but sometimes we have mammitis and suppuration, and even death of one gland or more, which has been believed to arise from not drawing the milk from time to time. Just imagine a cow cared for in a comfortable house, turned out to grass, and exposed to the night air, while the udder has to undergo the physiological change described. Do we not wonder that there are not more cases of mammitis? I believe the cow should be allowed to go dry before leaving her comfortable home; thereby we should have much less serious results, and none at all if she is thoroughly protected from colds and draughts.

Now then, gentlemen, if overstocking (independent of any artificial plugging) is torture, do you think that it could exist without leaving some bad results, such as the milk tinged with blood, etc., etc.? I would ask you as practical men, how often have you been called to treat cases resulting from overstocking; also have you ever seen any bad results arising from it? This is the proper method to arrive at a true issue of the question, an issue which seems to be as little considered or dealt with in the sister profession as in our own. I have made it my business to seek information at the hands of eminent medical men, and nowhere have I found a clear perception of the operation of nature under the circumstances set forth in this paper. And universally I have found that the rule of thumb, and unstudied ideas have obtained, which ideas have been overthrown by a discussion of the plainly indicated surroundings of the matter, and astonishment has been expressed at the utter absence of reliable data, study, or examination on this, which ought to be considered in the opinion of all with whom I have come in contact, an *initial* and *vital* question.

By way of conclusion I would just say that when in Ayrshire in practice, I never saw cows look so happy and jolly as when standing at the gate waiting for the milkmaid with their distended sides and udders, in many cases with milk flowing, and chewing the cud. I could liken them to nothing so much as to a Highland man with a few extra glasses of his mountain dew, *jolly fou*. Our cry is more light, and we trust the ventilation of this subject here, and elsewhere, will bring it, and so help us to declare authoritatively what is, or what is not torture.

In discussion the PRESIDENT denounced the practice of milking cows in the market to the extent of six or eight quarts and allowing the animals to stand exposed to wet, colds, and draughts, for hours afterwards, as conducive to evil results. If this is not cruelty it is the precursor of it.

Mr. BRIGGS said he had known mammitis produced from overstocking, but could not understand the good of the act, as it did not benefit the cattle-dealer or purchaser. He was of opinion the cow had no control over the teat or udder, as there was no voluntary structure in the udder.

Messrs. NAYLOR, AXE, PETER WALKER, and JOS. CARTER thought overstocking did not amount to an act of cruelty, as they had never known any injurious effects occur subsequently, and thought the cow possessed some control over the flow of milk.

The SECRETARY said overstocking was a matter of degree, and that in extreme cases unnecessary pain was caused. He would not give an opinion on a case of overstocking unless he examined the cow.

Mr. GREAVES said overstocking was not necessary and caused pain, and remarked that young beasts with small teats being unable to relieve the pressure of the milk, must suffer very much. He had seen mammitis arise from neglect of milking, and was quite sure it was an act of cruelty to drive a cow with an over-distended udder.

Mr. NAYLOR moved, and Mr. GREAVES seconded, a vote of thanks to the President for his paper. (Carried unanimously.)

The President and Mr. A. W. Briggs have promised to introduce papers for discussion at the next meeting.

W. BROUGHTON, *Hon. Sec.*

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

(*Continued from page* 224.)

Inasmuch as every drug has a mode of action peculiar to itself, it must be given alone if you are to obtain the full benefit of its action; for combination with one or more different drugs must neutralise its own peculiar effect. Were it not really an ascertained fact it would seem incredible what an accumulation of remedies were mixed together in prescriptions during the seventeenth and eighteenth centuries; for instance, the Venice Treacle and Mithridate of the London Pharmacopœia of the Royal College of Physicians, the former contained sixty-five ingredients and the latter fifty. Dr. Paris, in his "Pharmacologia," attempted a defence of the theory of combination; but upon this subject he could hardly have been very thoroughly convinced, for he says elsewhere, "Simplicity should be regarded by the physician as the greatest desideratum. I was once told by a practitioner in the country that the quantity, or rather the complexity, of the medicines which he gave his patients—for there never was any deficiency in the former—was always increased in a ratio with the obscurity of their cases. 'If,' said he, 'I fire a great profusion of shot, it is very extraordinary if some do not hit the mark.' A patient in the hands of such a practitioner has not much better chance than a Chinese mandarin, who, upon being attacked with any disorder, calls in twelve or more physicians, and swallows in one mixture all the potions which each

separately prescribes! Let not the young practitioner, however, be so deceived; he should remember that unless he be well acquainted with the mutual action which bodies exert upon each other, and upon the living system, it may be laid down as an axiom that in proportion as he complicates a medicine, he does but multiply the chances of its failure. *Superflua nunquam non nocent*—let him cherish this maxim in remembrance, and in forming compounds always discard from them every element which has not its mode of action clearly defined and as thoroughly understood." This is good advice of Dr. Paris, and if followed out in its integrity must result in the prescribing one medicine at a time, for it cannot be declared of any compound, even though it contain two ingredients only, that its mode of action is either "clearly defined or thoroughly understood." A drug when administered alone is certainly more likely to act safely, nor is there the possibility of its action being neutralised or otherwise affected as when mixed with other drugs; it would therefore appear that, from a scientific standpoint, everything is in favour of the single remedy at a time.

But, to proceed, the next subject for consideration is that of Posology; many persons confound their minds by declaring at every available opportunity that this therapeutic law is nothing more than a system of infinitesimal dosage. Now, in order that I may arrest your attention, I shall rely upon the bluntest denial of this statement that I can make, and say it is nothing of the sort! So far as the law itself is concerned, it is quite independent of the dose; but it is also a fact that the followers of Hahnemann have found by experience that it is not necessary to successful treatment that drugs should be administered in considerable quantities. Nay, more, they have received the most abundantly convincing proofs that doses which are inconceivably small are sufficient to effect cures. When Dr. Hahnemann first put his newly discovered law into practice he was accustomed to administer ponderable quantities of drugs, but as time went on, and he gained more and more experience, the dose was again and again reduced until the attenuation of his remedies up to a very high degree was attained, and with but few exceptions the followers of this great master have down to the present day walked in the same footsteps. But I must reiterate my original assertion that the subject of the dose is quite an arbitrary matter; it has nothing whatever to do with the law; this reiteration I deem the more important that, whatever may be your ultimate opinion of the value of this law, you may be preserved from falling into the error of confounding the law with the dose, as many opponents have heretofore wilfully persisted in doing, thus proving how superficially they had studied the matter, and how lamentably ignorant of the truth they remained. This piece of practice has not been without its influence on writers of the orthodox school, notably Dr. Ringer, whose work on therapeutics is doubtless well-known to you all.

It will, I conclude, be acknowledged that when administering a given remedy for a diseased condition, it is not requisite to give so much of the drug as is necessary to produce a physiological effect, in consequence of the irritation, and hence the enhanced susceptibility of the affected organ or tissue; for instance, "ordinary doses of arsenic, against which even a healthy stomach needs to be shielded, would increase the irritation of one already inflamed," for which the law would direct its being given; the requisite conditions of such a case are that the proper remedy should be administered at a strength not sufficient to produce a physiological effect, but to extinguish the morbid state. The matter of the dose must, therefore, be one of experience. Infinitesimal quantities of drugs, the presence of which could neither be demonstrated by the microscope nor by chemical test, have been proved capable of curing disease over and over again This to many has been a difficulty of so startling a character that it seemed incapable of being over-

come ; to ask a person to accept this doctrine of dosage, who had not fairly tested it, sounds very much like requesting him to forfeit his common sense ; but then there is no getting over the fact that infinitesimal doses have been the means of effecting cures after the administration of considerable quantities of drugs, and also after the do-nothing expectant treatment had been fully tested and failed; and it does seem, to say the least, unwise to refuse to accept the validity of a cure under such circumstances, because we are incapable of reasoning how it is an almost imperceptible quantity of a drug could act. But in order to show that very minute quantities of certain drugs are capable of producing marked effects, I will quote from Dr. Hughes, where he says, "Take the influence of atropia in dilating the pupil. The atropised gelatin, prepared by Savory and Moore under the direction of Mr. Ernest Hart, purports to contain but $\frac{1}{100000}$ of a grain in each disc ; yet it answers its purpose excellently well. Professor Donders (cited in the fourth edition of Pereira's 'Materia Medica') finds that in dogs the attenuation of atropia may be carried up to the $\frac{1}{7000000}$th before the effect becomes doubtful ; and it is possible, from the experiments of Rossbach and Frölich, that the doubtfulness arose from contraction being produced by the drug when reduced below the dilating point. Professor Donders, moreover, adds : 'The sensitiveness of the eye to atropia, indeed, excites astonishment, when we consider that of the single drop of attenuated solution which suffices to produce dilatation, probably not a fiftieth part is absorbed.' Nor is it the pupil only that these dilute applications to the eye can affect. Dr. Harley records an observation of 'congestion of the entire conjunctiva, with dryness of the membrane and dull aching pain in the eyeball, lasting for several hours,' occurring after the instillation of twelve drops of a solution of one part in 400,000 of water. We have only to go somewhat lower in the scale of fractional minuteness to see the drug affecting the whole organism from within. Dr. Ringer finds the 200th of a grain of atropia, subcutaneously injected, sufficient to dry up the whole surface of the body, even when freely perspiring in the Turkish bath ; and Dr. Harley writes of this substance : 'An infinitesimal quantity—a mere atom—as soon as it enters the blood originates an action which is closely allied to, if it be not identical with, that which induces the circulatory and nervous phenomena accompanying Meningitis, Enteric or Typhus Fever.' Aconitine carries us a step farther. The 300th of a grain of this alkaloid was found by Dr. Milner Fothergill sufficient actually to kill a rabbit of three pounds weight ; while guinea-pigs are so extraordinarily sensitive to its lethal influence that one weighing a pound died in three hours and a half after the administration of the $\frac{1}{1200}$th of a grain. After these experiences you will not be surprised to hear that Professor Arnold, of Heidelberg, found tetanus readily produced in frogs by the $\frac{1}{100000}$th of a grain of strychnia. Even the $\frac{1}{1000000}$th caused increased reflex excitability ; and in one of these creatures which the day before had been tetanic for some hours after the $\frac{1}{100000}$th had been administered to it, but had quite recovered, a slight attack came on in half an hour after receiving the $\frac{1}{1000000}$th, which ended after some hours in its death." These facts, which Dr. Hughes so lucidly explains, exemplify the physiological effects of very minute quantities ; surely, then, we need no longer wonder that infinitesimal doses are quite capable of producing marked effects under pathological conditions ; hence Dr. Hahnemann's proposition that remedies "must be given in doses smaller than those employed for the development of morbid states in the healthy."

It would be to deal most carelessly with this subject were I to leave unconsidered the relation of pathology to therapeutics, if for no other reason than that the portion of the medical and veterinary professions who practise what is sometimes called "orthodox," or "rational medicine," consider the

basis of therapeutics rests in principle and application upon the facts of pathology. For the clear elucidation of this subject, as well as many other suggestions which have proved very helpful in the working up of this paper, I owe, and desire to make my acknowledgments to Dr. Carroll Dunham, in his able literary production, entitled, "The Science of Therapeutics." In order that there may be no misapprehension, it is essential that we should have a clear understanding as to the definition of terms. First, then, let me remind you that in studying the science of the tissues and organs of the healthy body you have to deal with physiological anatomy, and that the science of the functions of the healthy living organism is entitled physiology; the difference is at once apparent; in the same way when the tissues or organs of the body are affected structurally as the consequence of disease you have before you an opportunity to study pathological anatomy which may be observed either upon the living or dead organism; whereas when the function of any organ of the body is perverted, the study of the alterations constitutes the science of pathology, which can only be observed on the living subject.

"Pathological anatomy, then, is the science of the morbid tissues and organs of the diseased body. Pathology is the science of the abnormal functions of the diseased living body." Dr. Carpenter defines physiology as the science which treats of the phenomena of normal life, and pathology as the science of the phenomena of disease or abnormal life. But what is it that in disease or abnormal life is affected? Virchow says: "The chief point is to obtain a recognition of the fact that the cell is really the ultimate morphological element in which there is any manifestation of life, and that we must not transfer the seat of real vital action to any point beyond the cell." This cell is endowed with a power of attracting and drawing to itself what is requisite from the nutritive fluid to enable the particular organ so built up of cells to fulfil its ultimate destiny of secretion, etc.; should a certain secretion differ from what is found in the healthy organism to be its normal or healthy condition, then the cell is performing its function abnormally, and we recognise disease. The abnormal secretion is not the disease, but the result of it. Just so; "the abnormal functions and the altered tissues of the diseased body which are respectively the subjects of the science of pathology and pathological anatomy are not disease itself, but only the results of disease. These distinctions have a direct and most important bearing upon the science of therapeutics, which has for its object the cure of disease."

What we have to do, then, to effect cures, is to address ourselves to the application of such remedial measures as shall influence directly the abnormally acting cell; the use of diuretics, for instance, cannot properly be termed a therapeutic measure, inasmuch as their use involves a mechanical action for the removal through the urinary organs of effete matter; neither can the use of neutral salts for the solution of an exudation be termed a therapeutic measure; it is no more nor less than a chemical action. Pathology, therefore, while a most valuable aid to the practical application of therapeutics cannot possibly be accepted as the basis of cure. "Pathology is the science of disease based on a theory of observed morbid processes; therapeutics, when truly regarded, is a science of cure based on a theory of cure and resting on a foundation of experiment."

You will most probably expect that I should furnish some clinical proofs of the efficacy of the system I have been advocating; and abundant cases within my own personal experience are at my disposal, to say nothing of the hundreds and thousands of very remarkable cases cured under this system, after having been pronounced incurable under "rational medicine," that I might quote: but I prefer to confine this illustrative portion of my paper to one particular disease, the cure of large numbers of cases

of which was verified by parliamentary commission, and about which it is impossible for any one to cast any doubt. I refer to Cholera; that same disease for which Dr. Hahnemann prescribed the remedies, before he had seen a single case, merely from representations of the symptoms evinced in various stages of the disease, and which remedies have proved equal to the saving of many lives in the proportion of 16 per cent. of fatal cases as against 59 per cent. under "rational medicine"; the remedies being camphor, cuprum, arsenicum, and veratrum album, according to the stage of the disease. In a large majority of cases, if taken in time, viz., during the stage of invasion, when the sinking of strength, coldness, and anxieties present themselves, nothing more than camphor is requisite. Dr. Rubini, of Naples, during an epidemic, treated in conjunction with colleagues no less than 592 cases with camphor without a single death. In 1854, by order of the English Government, a Medical Council was appointed to gather returns of the treatment and mortality of Cholera under every method, a report of which was to be presented to Parliament. When the said Report was laid before the House of Commons, it was discovered by, I believe, the present Lord Ebury, that the returns of those practitioners who were followers of Hahnemann, together with those of the London Homœopathic Hospital, had been excluded; the House of Commons thereupon called for the returns that had been rejected and excluded by the Medical Council, and it transpired on the evidence of Dr. McLoughlin, an eminent physician of the orthodox school, who was Government inspector of Cholera hospitals by appointment of this same Medical Council that the mortality of Cholera in the London Homœopathic Hospital was 16·4 per cent., whereas during the same epidemic the mortality under "rational medicine" was 59·2 per cent.

Dr. McLoughlin in his report stated as follows:—"That there may be no misapprehension about the cases I saw in your hospital, I will add that all I saw were true cases of Cholera, in the various stages of the disease; and that I saw several cases which did well under your treatment which I have no hesitation in saying would have sunk under any other."

It would be, to me, intensely interesting to know what that sworn and bitter foe of Dr. Hahnemann and his principle, the *Lancet*, would say to this evidence. Of one thing I have little doubt, that in some way it would account for these same reports with a view to discredit them, for it seems to be a part of the mission of the *Lancet* to enact the rôle of Censor on all those who follow Hahnemann. It matters little, however, what the *Lancet* may have to say on this subject, for no amount of invective will stay the spread of this principle, and those who accept and practise it can well afford to smile at the leading medical journal when it becomes irate upon this subject. There is one more point worthy of your notice, before I close, respecting Cholera; as you are aware certain German pathologists allege that they have discovered, after researches made in Egypt and India, the cause of this disease; the germ-hypothesis is what they support, and yet once more we have another type of Bacillus. On Nov. 9th, 1883, there appeared an article in the *Pall Mall Budget* from the pen of Professor Ray Lankester, entitled "The British Government and the Cholera Germ." The Professor seems to think that the first time this suggestion was offered emanated from Dr. Lewis and Dr. Cunningham, when they were making researches in India some twelve or fifteen years ago; the Professor is either ignorant of the fact or prefers to ignore it, that, in 1831, Hahnemann published a paper in his "Lesser Writings," entitled "The mode of propagation of Asiatic Cholera," in which the following remarkable statement appears:—

"On board ships, in whose confined spaces, filled with mouldy watery vapours, the Cholera-miasm finds a favourable element for its multiplica-

tion, and grows into an enormously increased brood of those excessively minute, invisible, living creatures, so inimical to human life, of which the contagious matter of the Cholera most probably consists—on board these ships, I say, this concentrated, aggravated miasm kills several of the crew." This was in 1831, and is therefore slightly in advance of the German Commission, but I suppose, because it appears among the writings of Hahnemann, it is unworthy the consideration of such an eminent authority as Professor Koch. Other articles have appeared in the same periodical from the pens of great men of the present day, wherein the writers profess to have made discoveries that are the veritable A B C of practice among Hahnemann's followers; this is extremely amusing, and the thought at once arises in the mind, Whence obtained they their suggestions? are they really original conceptions?

I mention these things, not to discredit scientific workers of our own times, but to show how far Hahnemann was in advance of his own time, and therefore that the opinions of a man with such a mind and capacity as he enjoyed cannot be other than worthy the earnest consideration of all well-intentioned and serious men of the present day.

The statistics I have laid before you of the success attending the treatment of Cholera as compared with that obtained in orthodox practice are pregnant with suggestiveness: even 16 per cent. is a lamentable mortality, but when compared to 59 per cent., what can be said? Surely such evidence ought to arrest the attention of the most sceptical. For myself, I have long been satisfied of the truth of the principle; so much so that I am prepared to affirm as my sincere conviction that in "Similia similibus curantur" is to be found the only true law of healing.

Nearly all the members joined in the discussion, and after the essayist had replied, a cordial vote of thanks was awarded him for the excellent paper he had brought before the society.

J. B. WOLSTENHOLME,
Hon. Sec.

Army Veterinary Department.

WAR OFFICE, *Gazette*, August 26th.

THE following gentlemen to be veterinary surgeons on probation:—Tom Marriott, Henry Aloysius Fullam, Henry Thomas Pease, Charles Henry Betser, George Henry Evans, Ernest Reuben Charles Butler.

Veterinary Surgeons Burt, Phillips, Griffith, and Bennett have left England for service with the Expedition to Khartoum. Veterinary Surgeons Dibben, Sartin, Davis, Joslen have embarked for a tour of service in India. Veterinary Surgeons Dawson, Healy, Killick, and D. Pallin have returned from India for duty at home. The Principal Veterinary Surgeon, Dr. Fleming, while on a tour of inspection in Ireland, accompanied by Inspecting Veterinary Surgeon Walters, was suddenly attacked by serious illness at Limerick on September 4th. He is now, however, progressing favourably towards recovery.

Obituary.

THE following deaths have been reported:—James Freeman, F.R.C.V.S., Hull, graduated Feb., 1834; James Hall, M.R.C.V.S., London, graduated March, 1842; A. M. Metherell, M.R.C.V.S., Brighton, graduated April, 1867; F. Unterberger, Dorpat, appointed Honorary Associate Oct., 1880.

We also hear of the death, on September 19th, of Thomas Davis Gregory, F.R.C.V.S., of Bideford, North Devon.

The death is also reported of S. H. Withers, F.R.C.V.S., of London, in the eighty-second year of his age. Mr. Withers was greatly esteemed by the profession in London and by a wide circle of friends. For many years he was a member of Council and Treasurer to the Royal College of Veterinary Surgeons.

Notes and News.

IMPORTS AND EXPORTS OF LIVING ANIMALS.—At length our leisurely Agricultural Department has put us in possession of the revised and complete figures relating to the imports and exports of 1883. The following tabular statement has been compiled from the new returns, as the readiest means of showing the sources of the imports named:—

	Horses.	Oxen & Bulls.	Cows.	Calves.	Sheep & Lambs.	Swine.
Russia	10	—	—	—	—	—
Sweden	22	17,989	4,808	4,522	7,958	—
Norway	8	870	117	—	2,837	—
Denmark	3,165	60,834	50,696	8,311	125,438	3,725
Germany	4,509	28,182	—	—	488,428	6,495
Holland	1,190	3,995	1,021	33,939	217,124	28,412
Belgium	271	—	—	—	90,281	—
Channel Islands	95	118	2,228	208	—	—
France	1,012	3,287	—	—	446	228
Portugal	—	21,886	—	—	—	—
Spain	—	23,485	—	—	—	—
Victoria	—	—	1	—	—	—
British North America ..	12	52,048	1,087	—	94,285	—
United States of America ..	92	154,982	74	—	89,083	—
British West India Islands	—	6	—	—	—	—
Other Countries	23	—	—	76	235	3
Total	10,409	367,662	60,032	47,056	1,116,115	38,863

The value of these imports was :—Horses, £212,033 ; oxen and bulls, £7,929,246 ; cows, £1,183,477; calves, £219,519 ; sheep and lambs, £2,518,382 ; swine, £133,130 ; unenumerated, £30,347 ; total, £12,226,134. It is worth pointing out here that last year's imports of oxen and bulls were larger than they have been in any previous year. In 1869 the value of imported oxen, bulls, cows, and calves did not exceed £3,833,850, and in 1872 the amount fell down to £2,676,379. Three years later the figures were £4,885,462, and since then, with but two exceptions, there has been an annual increase, while nearly £3,000,000 more was paid away in 1883 than in the preceding year. The imports of sheep and lambs have not exhibited such an extensive development. The lowest point was reached in 1870, when our imports cost £1,151,373, and the highest figure was attained in 1883, when it stood at £2,558,827. With regard to last year's imports of poultry and game, alive or dead, including rabbits, we may add that the declared value was £591,895. As regards exports it appears we last year sent away 7,376 horses, which realised the sum o

£410,269. As many as 1,659 went to France, Belgium took 1,549, Holland 1,538, and Germany 448. British North America purchased 971, and the United States 862, while to Australasia we sent 71, and to the Argentine Republic 33, leaving 245 for distribution among other countries. On an average every horse sent out of the United Kingdom brought over £55. The exports of bulls, oxen, cows, and calves are included under one heading. They numbered 5,313, valued at £193,202. The greatest demand came, of course, from the United States, from whence we received £114,477 for 2,803 animals. British North America, however, purchased from the United Kingdom 2,007 cattle for the sum of £55,704. To the Argentine Republic we despatched 115 animals, to Chili 72, to Germany 49, and to Belgium 29, the remaining 238 going "to other countries" of which no indication is given. Our exports of sheep and lambs produced £42,759, the total number being 5,719. Very nearly 3,000 of these went to Germany, just over 1,000 to the Channel Islands, 600 to British North America, and nearly 500 to the Argentine Republic. The total exports of swine during the year did not exceed 373, but that the business was worth doing is apparent from the fact that they fetched £2,017, or nearly £6 apiece. In addition to the foregoing, we exported 4,118 living animals, not otherwise specified, the value of which was declared to be £16,747.

VETERINARY LITERATURE.—Mr. Henry Chaplin, M.P., has accepted the dedication of the "Manual of the Theory and Practice of Equine Medicine" by James Brodie and Albert Gresswell.

CHOLERA EXPERIMENTS ON ANIMALS.—Some interesting and, as some may deem, cruel experiments, writes a correspondent, have just been tried at Marseilles, with a view to ascertain how far dumb animals are susceptible of choleraic poison. The experimenters were Drs. Meati, a Swiss physician, and Rietsch, the victims three dogs and four guinea-pigs. Provided with the necessary appliances, these gentlemen, following the example of Dr. Koch, who visited their laboratory and favoured them with his advice, gathered thousands of cholera microbes from the intestines of still warm bodies, which the authorities placed at their disposal, and submitted the creators of the fell disease to various tests, the results of which will be made public for the benefit of science. The dogs and guinea-pigs were inoculated with bacilli, always with success. The creatures operated upon were invariably seized with diarrhœa and cramp, and otherwise showed the same symptoms as mark the malady in mankind. The guinea-pigs died in forty-eight hours at the utmost, the dogs in four days. The guinea-pigs in other respects manifested much greater susceptibility to the virus than the dogs. Instead of inoculating it, the experimenters in one instance injected the virus into a guinea-pig's intestinal canal. It died of Cholera. To make the inoculation operate more surely they also tied up the excretory biliary duct, and injected the virulent matter into the duodenum. In this way they proved that bile is a hindrance to the development of the microbes. In the blood of "cholerized" guinea-pigs, as in that of man, the globules are so softened as to prevent them from piling (*sempiler*), and they become deformed by reciprocal compression. This peculiarity is common to various conditions of Asphyxia. It is suggested that practical conclusions may be drawn from these facts. For instance, the inoculation of dogs and guinea-pigs is a sure way of diagnosing Cholera. When, henceforth, a town or a country is threatened by the epidemic, and doctors are in doubt as to the true character of a patient's symptoms, they may obtain positive knowledge within a few hours by injecting directly into a guinea-pig's duodenum part of the contents of the patient's intestinal canal. A second conclusion concerns a prophylactic against Cholera. The gastric juice and the bile are capable of destroying the microbes, and these two secretions are largely excreted in the

process of digestion rendered necessary by a meal, but they are hardly excreted at all when liquid alone passes through the stomach. Hence contaminated water is much less dangerous if drunk with a meal than when taken by itself. The parts played by indigestion and diarrhœa are of the same order, a fact which is regarded as a decisive confirmation of the relation between Cholera and bacilli discovered by Dr. Koch. Drs. Meati and Rietsch repeated their experiments last week in the Pharo laboratory before the hospital physician, the medical students, and the delegates from Barcelona.

Correspondence.

MENTAL IMPRESSION UPON FŒTUS IN UTERO.

DEAR SIR,—A chestnut cart-mare in foal was suffering from an injury, the surgical treatment of which needed the application of the knee-strap to restrain her movements. This was frequently used during a period of three weeks.

Some two or three months afterwards the mare foaled, and the young animal's near foreleg was bent in the same manner as her mother's had been when the knee-strap was applied.

We consider this fact of some interest, and forward you the particulars as illustrative of the influence of a mare's mind upon her fœtus.

12th September, 1884. EQUUS.

DEATH OF A COLT FROM DRINKING TAR.

DEAR SIR,—Thinking the following case of some interest and unique in its character, I beg to forward same for insertion in your next issue, and shall be glad to know if any of my fellow-practitioners have met with a similar one.

On the afternoon of August 11th ult., I was requested to see a yearling cart-colt which was off its feed. I found the animal standing up in one corner of the stable, with its head down and breathing quickly. Pulse 65 and full. The visible membranes were of a reddish-brown colour. The bowels were constipated, and the fæces had a peculiar dark coating. The urine was thick, and of a very dark red colour. The colt was first noticed to be a little dull and off its appetite two days before, but no particular attention was paid to it till the morning of August 11th, when it was thought to be in pain at times.

I noticed the sides and chest had patches of tar here and there, as if he had tarred his mouth and nose, and in brushing off the flies had smeared his body.

Upon inquiry I found they were tarring the farm buildings, and after a good deal of pressure the man admitted that when he fetched the colts in from the pasture on August 9th, this one just dipped his nose into the tar-tub as he passed it; but the man was quite sure he had not time to drink any.

I diagnosed the case as one of tar-poisoning, and administered ʒv. Aloes Barb. and Oss. Ol. Lini. cum ʒjss. Ol. Terebs. I also abstracted about Oj. of blood, which I found very thick and black, and with a decidedly tarry smell.

Some of this I placed under a microscope, but could detect nothing very definite for want of a higher power than I possessed. I particularly noticed that the blood would not coagulate.

I saw the colt early next morning, and found him, as I expected, much worse. He died in great agony about an hour after my arrival.

Post-mortem.—All the viscera and membranes were deeply stained, and of a reddish-brown colour; the blood remained fluid; the contents of the stomach and bowels were coated outside with tar, and there is no doubt the colt drank several pints. The day was intensely hot.—Yours, etc.,

Halstead, Essex. F. MORTON WALLIS, M.R.C.V.S.

"THE FINANCIAL CONDITION OF THE ROYAL COLLEGE OF VETERINARY SURGEONS."

SIR,—I have read with great interest your remarks on the above subject in last month's VETERINARY JOURNAL, and hope the Council will take the matter in hand at once, as the present state of affairs is very deplorable.

As Government does not appear disposed to help us in any way, it behoves the profession at large to help themselves, and I am quite sure that your suggested annual subscription of 10s. 6d. (I would rather say £1 1s.) from every member of the profession, would not be missed by any one of us, and would realise a good round sum. With it also we could have a museum and library, and be able to allow subscribers the privilege of using them, as, for instance, the Pharmaceutical Society do, their associates even subscribing 10s. 6d., and their members £1 1s. annually. Our motto, "Vis unita fortior," implies this plan of action, and the sooner some steps are taken in the matter the better. As affairs are at present, we are simply kept above water by the great exertions and munificence of a few individual members, and if an annual subscription were carried out, we should all be doing our quota for the general welfare of the profession, and be less likely to forget our alma mater as soon as we have passed its portals. The profession has made some rapid strides forward of late years, thanks to the efforts of certain noble-spirited individual members, and why let us retrograde, or stand still, with the preventive means in our hands?

JOHN GEORGE CROSS, M.R.C.V.S.

Shrewsbury, *September 13th*, 1884.

ALLEDGED CRUELTY TO A HORSE.

DEAR SIR,—The following is extracted from the *Manchester Examiner* of to-day, and is, I think, worthy of being recorded, especially when taken into consideration along with some statements made at our Congress in Manchester last month. Further comment is needless.—Yours faithfully,

Kirkham, *27th August*, 1884. G. GARTSIDE MAYOR, M.R.C.V.S.

"At the Manchester County Police Court yesterday, before Sir John Iles Mantell and Mr. W. Schofield, James Smith and Prince Derbyshire, of Harpurhey, were charged with cruelty to a horse of the last-named defendant. Inspector Gratrix, of the Royal Society for the Prevention of Cruelty to Animals, saw the horse at Blackley in charge of Smith, and on examining it, found on it two wounds such as, he said, would render the animal unfit for work. A wound on the near side of the back was 1½ inches long, and another on the off side was the size of a two-shilling-piece. The defence was that the wounds were only heat lumps, and that every precaution was taken to ease the saddle, and to prevent it bearing in the least on the wounds. A veterinary surgeon was called, and he described the wounds as mere heat lumps. They were only small, and could not have been aggravated by the work which the animal did, for the saddle was eased, and could not touch the wound.

"Sir John Mantell, in dismissing the case, said it was of the most frivolous nature. If the Royal Society, which he had the greatest respect for, condescended to take up such trivial cases, they were not doing good. People ought not to be called to answer charges of the kind before the court, and if they were so brought up, they ought to be indemnified for their loss of time in coming there. It was the firm opinion of the Bench that the case was a most frivolous one."

"PROFESSIONAL ADVERTISING."

SIR,—Professional advertising for public favour has now-a-days almost disappeared; there are still a few, however, here and there, who lower and degrade their professional status, and the status the profession is endeavouring to hold in the eyes of the public generally, by pursuing so unfortunate a course. The following, which I see has appeared in two local papers at Wrexham, is a rather extravagant specimen of the kind, and I shall be glad of your opinion thereon.—Yours, etc.,

"ETIQUETTE."

"A SUCCESSFUL VETERINARY SURGEON.—We are pleased to find that our well-known townsman, Mr. John Roberts, veterinary surgeon, has scored such success in his profession as to open an establishment at Smithfield House. Mr. Roberts holds high credentials. He matriculated at the Royal (Dick's) Veterinary College, Edinburgh, in 1878; graduated in April, 1881, after a most successful course of study at college; obtained two qualifications, viz., the diploma of the Royal College of Veterinary Surgeons, and the veterinary degree (now discontinued) of the Highland and Agricultural Society of Scotland, having passed five professional examinations and obtained honours at each; was a prizeman at college, and elected a Fellow of the Edinburgh Veterinary Medical Association in April, 1881. Of his success as a practitioner we need say little, it is so well known."

[We are convinced that the gentleman referred to in the above cannot have so far forgot his position, but is rather the victim of the mistaken zeal of friends.—ED.]

TO CORRESPONDENTS.

MR. PENTLAND, OF LETTERKENNY, CO. DONEGAL.—All information regarding the Army Veterinary Department will be found in the Register of Veterinary Surgeons for the present year.

M.R.C.V.S.—The second part of Fleming's "Operative Surgery" is in hand, and will be published at an early date.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from A. W. Hill, London; W. Broughton, Leeds; C. H. Huish, London; D. A. Gresswell, London; G. S. Mayor, Kirkham; R. H. Dyer, Limerick; V.S. J. Nunn, Punjab; V.S. Mills, Madras.

BOOKS AND PAMPHLETS: *A. Baranski*, Zähmung und Abstammung des Pferdes; *W. Ellenberger*, Lehrbuch der Allgemeinen Therapie der Haussaugethiere; *H. Hallopeau*, Traité Elementaire de Pathologie Générale, Comprenant la Pathogénie et la Physiologie Pathologique.

JOURNALS, ETC.: *Medical Press and Circular; Journal de Médecine Vétérinaire; Archives Vétérinaire; Revue Vétérinaire; Live Stock Journal; Edinburgh Medical Journal; Journal of Comparative Medicine and Surgery; American Veterinary Review; Il Medico Veterinaria; Der Hufschmied; L'Echo Vétérinaire; La Presse Vétérinaire; Mark Lane Express; Field; Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie; Repertorium der Thierheilkunde; Clinica Veterinaria; Quarterly Journal of Veterinary Science in India; Recueil de Médecine Vétérinaire; Der Thierarzt; Wochenschrift für Thierheilkunde und Viehzucht; Annales de Médecine Vétérinaire; Lancet; British Medical Journal; National Live Stock Journal; Practitioner; Bulletin de la Société Royale Protectrice des Animaux de Belgique, Mai, Juin, Juillet, Aout, 1884; Bulletin et Mémoires de la Société Centrale de Médecine Vétérinaire, Paris, Année 1884; Srijks veeartsenijschool te Utrecht; Bulletin du Comité Consultatif pour les Affaires Relatives aux Epizooties, Bruxelles.*

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